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STORAGE BUZZ From IPSec for storage to NAS/SAN convergence, we look at technologies, trends changing the shape of storage networks. **INSERT FOLLOWS PAGE 2**

NetworkWorld

The leader in network knowledge ■ www.nwfusion.com

May 27, 2002 ■ Volume 19, Number 21

Early users laud 802.11a LANs

■ BY JOHN COX

The first class of 802.11a wireless LAN users say the technology lives up to its advanced billing as a much speedier alternative to its predecessors, although it is not without shortcomings.

The 802.11a radios and adapters, rated to run at up to 54M bit/sec in the unlicensed 5-GHz band, have proven simple to install and are priced aggressively vs. 11M bit/sec 802.11b wireless LAN gear.

As with any new technology, some issues still need to be addressed. For instance, vendors just now are introducing authentication based on the IEEE 802.11X standard. And early adopters say management tools for 802.11a are fewer — and less sophisticated — than those for 802.11b.

But if bandwidth is what users crave, 802.11a products deliver.

"We tested products by using laptops, playing DVD movies on our LAN and walking 40 to 50 feet [from an 802.11a access point]," says John Bucek, executive director of IT at Mount Saint Mary College, a liberal arts college of about 2,500 students in Newburgh, N.Y. "The movies played without a glitch. We didn't do complex calculations, but it was

See 802.11a, page 71

Smart routing:

If you're using multiple ISPs, there are new products and services that can pick the most cost-effective route for your Internet traffic on the fly.

Page 49

MICHELLE BARBERA

NEWSPAPER ■ $5.00

S00

Telecom vendors look to turn tide

■ BY TIM GREENE

ATLANTA — It won't be flash over substance as the telecom industry descends on Atlanta for next week's SuperComm 2002. Having new customers to brag about might prove more valuable to vendors than any breakthrough product on the show floor.

The bad economy that has slammed the telecom sector (see graphic, page 70) has vendors desperate to prove they have the products that service providers want and that will ultimately let them offer more advanced services such as voice over IP (VoIP) or more efficient DSL offerings. No fewer than a dozen vendors are using the show to announce customer contract wins. Others such as 3Com and VocalTec will be rolling out products, including a spate of softswitch, DSL and ATM gear that could translate into new customer services.

■ Juniper snaps up Unisphere, see page 71.

Among those announcing customers are Adtran, Aravox, Catena Networks, CommWorks, Gamma Projects, Integral Access, LightPointe and VocalData, giving them bragging rights for selling their products to penny-pinching service providers.

"Everyone is scrambling to say, 'I have something carriers want. This is something they're willing to spend money on,'" says Christopher Nicoll, vice president of telecom infrastructure at Current Analysis. On the carrier side, the goal seems to be finding a way to boost profits by delivering traditional services to business users less expensively now rather than spending money on gear that might create new services and revenue down the road, he says.

See SuperComm, page 70

SUPERCOMM Planning Guide

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■ FOLLOW THE MONEY

Stuck in start-up mode

■ BY CAROLYN DUFFY MARSAN

Once youthful and flush with green, many venture-funded network start-ups have been ripening on the vine for so long that they are starting to look past peak.

In the late 1990s, few network start-ups received more than five rounds of venture financing before going public or being acquired. Now many companies are accepting six, seven, even a dozen cash infusions to keep their businesses alive until the public markets turn around.

13% of Q1 awards were the recipient network company's sixth or higher round of venture financing.

SOURCE: MONEY TREE SURVEY

With the IPO market lying dormant for the past two years

See Start-ups, page 14

"He said we should _

Get your infrastructure ready for anything. You've got relentless hackers, massive usage spikes, 24/7/365 demands, big CEO requests, etc., etc., etc. What is going on here? This, of course, is today's unpredictable business environment. In this environment, where _______ can happen at any moment, you need to keep your infrastructure prepared for anything and everything. And that is exactly what the Microsoft® platform is designed to help you do. Here's how:

Security

The Microsoft platform helps provide the secure infrastructure that enables confident computing in a dynamic Internet-enabled environment.

The Microsoft platform enables high levels of security through built-in encryption, authentication, and access control that can be centrally managed and integrated. In addition, it helps protect sensitive data and applications by securing your network perimeter against attacks and unauthorized use.

Manageability

The Microsoft platform allows you to build and maintain a technology infrastructure that is reliable, cost-effective, and easily modified to meet changing business needs.

Microsoft Systems Management Server 2.0 provides comprehensive hardware and software inventory, enterprise software distribution, remote control, and software metering for Microsoft Windows®-based desktops and servers. Microsoft Active Directory® service and Group Policy features in the Windows 2000 Server family simplify management of users and devices. Microsoft Operations Manager 2000 provides enterprise-class event and performance management. And Microsoft Application Center 2000 makes the management of Web server farms as simple as managing a single server.

*This level of availability is dependent on many factors outside of the operating system, including other hardware and software technologies, mission-critical operational processas, and professional sarvices. †Source: Transaction Procassing Parformanca Council, May 2002. © 2002 Microsoft Corooration. All rights reserved. Microsoft, Active Directory, BizTalk, and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. The names of actual companies and products mentioned herein may be the trademarks of their respective owners.

”

Interoperability

The standards-based technologies in the Microsoft platform work with your existing infrastructure, support future technology investments, and leverage your investment in the skill sets of your current staff.

The Microsoft platform can enable communication with other operating systems, including UNIX-, NetWare-, and IBM-based systems, using common protocols. It can also access file shares and printers on other platforms, integrate new applications with existing data sources, and reduce the burden of administering multiple systems. And XML-enabled Microsoft BizTalk® Server 2002 even allows you to orchestrate business processes and applications across organizational boundaries.

Reliability

With the right investments in people, processes, and the technology of the Microsoft platform, you can achieve the highest levels of reliability you need to run your business.

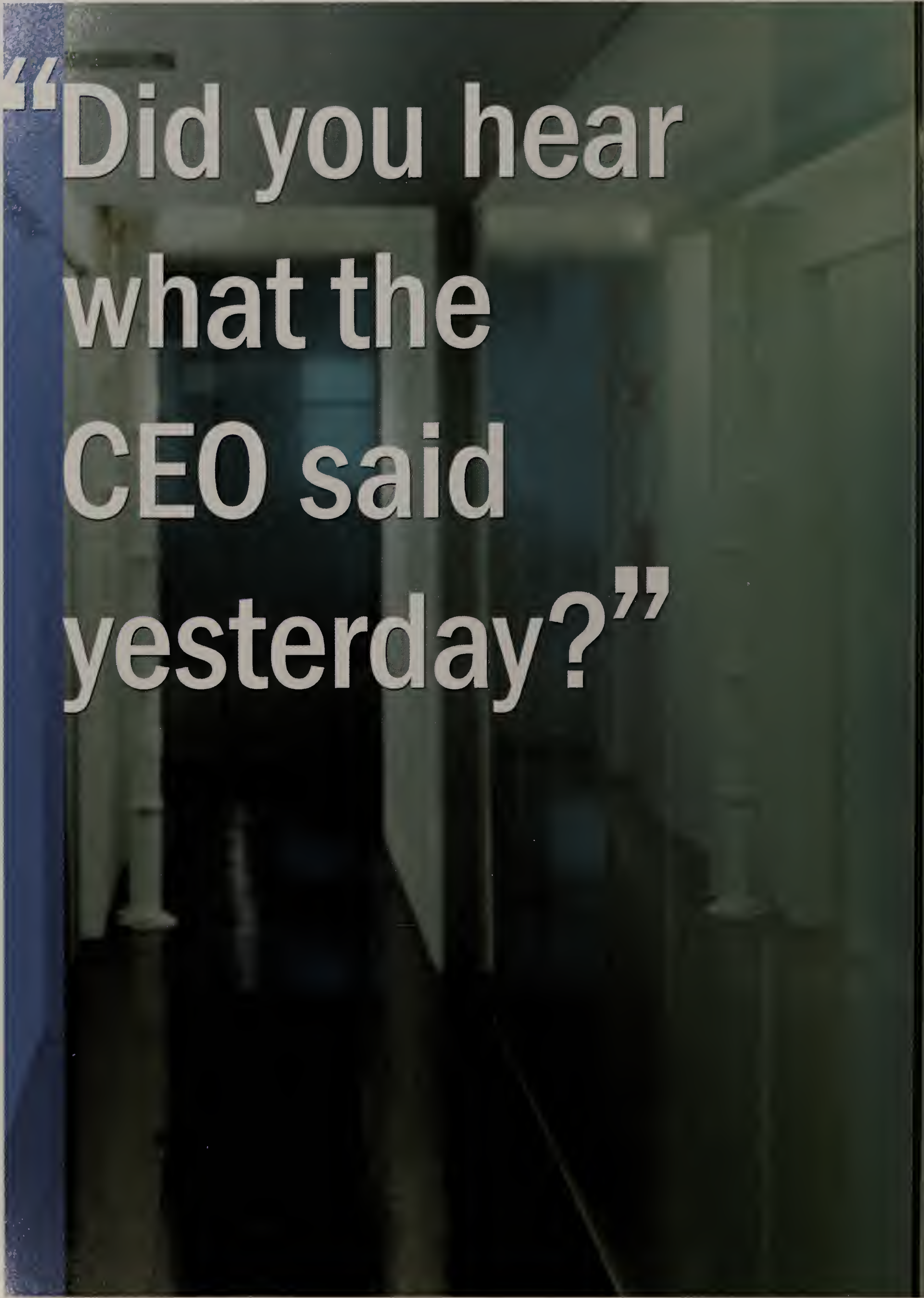
The Windows 2000 Server family delivers up to 4-node clustering and 32-node load balancing to support mission-critical applications and solutions. Features like these, along with established best practices and support from Microsoft's industry partners (including fault-tolerant systems vendors), allow customers to build solutions that provide up to 99.999% service availability.*

Scalability

The Microsoft platform scales to handle your most demanding workloads.

The Microsoft platform gives you the choice of thinking bigger, smaller, up, or out, with the lowest price-to-performance ratio of any competitive platform.† You can deploy Microsoft SQL Server™ 2000 on Windows 2000 Datacenter Server for heavy-duty ERP and transaction processing, and scale up to support terabytes of data and millions of transactions. Or scale out with Application Center 2000 by adding clusters of Windows 2000–based servers running distributed applications. Either way, the scalability you need is there.

For more information on how to prepare your infrastructure for ____________, ____________, and ____________, visit **microsoft.com/enterprise** **Software for the Agile Business.**



“Did you hear what the CEO said yesterday?”

Microsoft

Experiencing IP Voice

Experio Solutions cuts costs and management headaches with nationwide Shoreline IP voice network.

When Mike Shisko set out to look for a new phone system that would serve the 480 employees in his company's 14 offices throughout the United States, he did not have IP voice in mind. Shisko is director of information technology for Dallas-based Experio Solutions, an IT consulting firm created by Hitachi when it acquired a piece of a large consulting company. After the sale, Shisko was essentially given a clean slate on which to map Experio's voice and data strategy.

Shisko already had significant experience working with private branch exchanges (PBXs), having held responsibility for telecom as well as data networks for the previous six years.

Eventually, he came across an IP voice system from Shoreline Communications. Shisko was initially attracted to the Shoreline3 suite of IP voice products because it offered a single point of administration, a consistent feature set for offices of all sizes, and easy connections to the public switched telephone network (PSTN) for local calling and backup – all at a reasonable price. Since installing the system, he's also found it to be highly reliable and even more cost-effective than expected, given reduced administration costs and savings in long-distance charges resulting from shipping calls over the Internet.

Shisko's positive experience is due in large part to Shoreline's approach to IP voice. Rather than try to retrofit a PBX or router to take on functions for which they were never intended, Shoreline3 was designed solely to offer reliable voice services over an IP net.

There are a couple of keys to the reliability built in to Shoreline3. First are the ShoreGear voice switches that provide call setup and teardown functions. All switching functions are performed in hardware using Shoreline's VxWorks, a real-time operating system similar to that used in pacemakers.

"In the legacy PBX world, five nines reliability is a familiar benchmark," says Greg Ness, director of marketing communications for Shoreline, referring to systems that are operational 99.999% of the time. "With a pacemaker, five nines isn't good enough. A few minutes of heart failure per year isn't a positive thing."

In addition to running on a highly reliable hardware platform and OS, each ShoreGear switch operates independently, without involving a central server, which means there is no single point of failure. Each switch also has its own connection to the PSTN and can provide dial tone for attached end devices, even during a power failure.

Experio's Mike Shisko is now an IP voice believer.

The ability to connect to the PSTN was an important consideration for Experio's Shisko. "We wanted a local dial tone in each office, and a lot of systems made that difficult to manage," he says. By contrast, once installed, each ShoreGear switch instantly finds the others, enabling a new office to start benefiting immediately from toll bypass. And the Shoreline equipment typically took only about two hours to get up and running.

Experio saves big with Shoreline

Per Site Acquisition Costs	Shoreline	Legacy PBX	Net Savings
Equipment, Network Upgrades	$30,000	$60,000	$30,000
Installation - Hard Cost	$0	$1,700	$1,700
Total Per Site Acquisition Costs	**$30,000**	**$61,700**	**$31,700**
Total Acquisition Costs (x16)	**$480,000**	**$987,200**	**$507,200**
Annual Costs			
Management	$39,600	$72,000	$32,400
Maintenance (based on 10.1%)	$48,480	$129,280	$80,800
Long Distance	$30,000	$151,000	$121,700
TCO Per Year	**$118,080**	**$352,280**	**$234,200**
Total Over 5 Years			**$1,678,200**

The savings to be realized from toll bypass are significant. Whereas Experio previously paid about $2,000 per office per month in long-distance charges, now it pays about $2,000 for all offices combined (see chart).

Administration costs have likewise dropped dramatically, he says. As compared with the PBX setup in use before the Hitachi acquisition, Shisko estimates the Shoreline gear cuts management costs by about 60%. He says the Web-based administrative interface is simple to learn and use, and configuration changes can be delivered at once to all ShoreGear switches. Previously, each PBX change had to be administered separately, a time-consuming process that also made it difficult to keep configurations uniform over time.

Hardware acquisition costs were likewise reasonable, because ShoreGear switches of all sizes support the same feature set. Users can start with a 12-port model and add capacity as requirements grow. That's a welcome feature for Experio, which now has 785 employees in 21 offices, barely a year after its initial Shoreline deployment.

Harder to quantify is the productivity gains that come from the applications included with the Shoreline3 system. These include personalized call control and management, a Windows program that enables users to control features such as multiparty conferencing, one-click dialing and screen pops that show callers' names. A Unified Messaging application is integrated with Microsoft Outlook, including the ability to coordinate call-handling features with Outlook calendars. Another feature, AnyPhone, lets Experio employees who travel frequently assign their extension and call-handling profile to any other phone in the network.

"The ability to have all your contacts available for dialing, to be able to cut and paste numbers off Web sites and dial them, to know who's calling you and to see voicemail in your email inbox –people have fallen in love with all that functionality," Shisko says. "Shoreline was a good decision for us. It's proven to be very cost-effective and flexible, and it's done everything we were looking for it to do."

For more information, see www.goshoreline.com.

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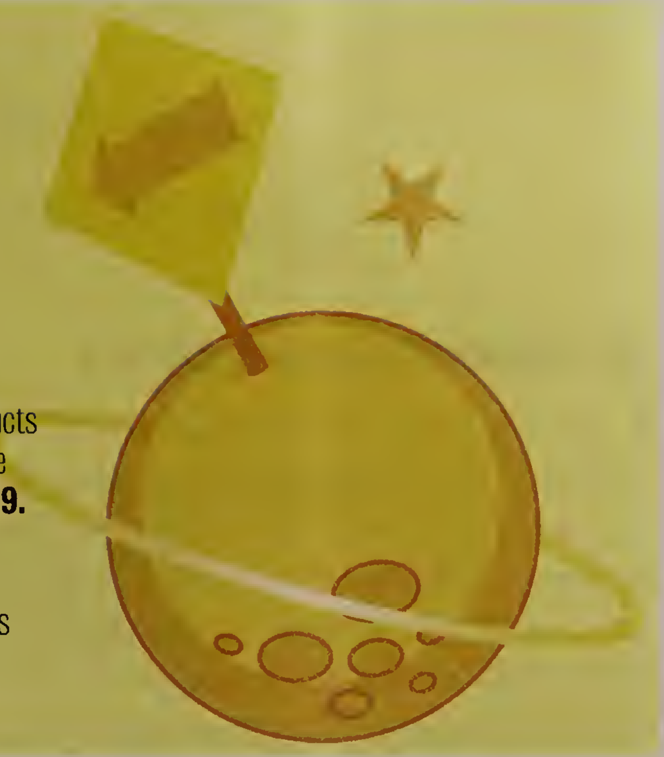

MICHELLE BARBERA

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Interactive

Network World 500 survey

Our ninth annual Network World 500 survey shows that security is still the No. 1 concern of network executives. Have your priorities or spending shifted since last year? See what your peers are saying.
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Network World 500 survey stats

Want more details on our annual survey? Read our story and request a copy of the report.
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Audio: Rethinking security in a dangerous world

Hear what a panel of experts has to say about the state of network security and what measures companies should take to secure mission-critical networks.
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Seminars and Events

State of Security: Your way toward a safe net

We know security is your top concern and you've got lots of questions. Find the answers at our Security Town Meeting. Register now for a city near you.
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Put file safety first
Columnist Jeff Gaskin discusses a variety of tools that back up and sync files automatically.
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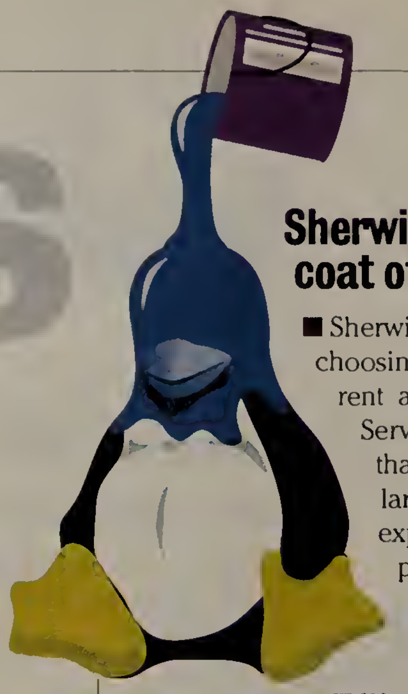

Sherwin-Williams takes on fresh coat of Linux

■ Sherwin-Williams is revamping the IT infrastructure of its retail stores, choosing Linux to replace the Unix operating system on which its current architecture is based. The company has tapped IBM Global Services unit to coordinate the migration, which will involve more than 2,500 stores in the U.S. and Canada. Sherwin-Williams, the largest U.S. paint company with 2001 revenue of $5 billion, expects the new Linux-based architecture to lower its IT costs, provide more flexibility for future IT upgrades and improve the stores' customer service, IBM says.

Sun shines light on Solaris 9

■ Sun last week officially launched its long-anticipated Solaris 9 operating system. Solaris 9 integrates Sun's Application Server, Directory Server and Java 2 Platform Enterprise Edition, and enhancements in the Unix File System and Solaris Volume Manager, which provides storage management tools. Solaris also now includes tools that let the operating environment be upgraded without downtime and lets software be deployed automatically across the network. Sun normally updates Solaris on a two-year cycle. Users already are making plans for Solaris 10, scheduled for release by mid-2004.

Ax falls at IBM manufacturing facilities

■ IBM late last week confirmed that it has laid off an undisclosed number of employees at U.S. plants where it makes servers. Although a company spokeswoman declined to say how many job cuts were made, *The Wall Street Journal* reported the cuts affected 560 people. The layoffs were made at the company's plants in Endicott and Poughkeepsie, N.Y.; Rochester, Minn.; and Research Triangle Park, N.C. Additional cuts were made at the company's Somers, N.Y., location, where its operating division is based. Rumors have been swirling that IBM would lay off as many as 8,000 employees, or 2.5% of its 320,000-strong workforce this quarter, given the still-sluggish economic outlook. IBM would not comment on whether more job cuts are in the works.

Worm targets SQL Server

■ A new worm that targets Microsoft's SQL Server database is making the rounds on the Internet, security experts warned last week. "We're detecting thousands of new compromised systems per hour as this propagates," says Tim Belcher, CTO at security services company Riptech. The worm is referred to variously as SQLSnake, DoubleTap and DigiSpid.B.Worm. Experts say it is unlikely to cause widespread damage. A Microsoft spokesman says the worm affects only systems running SQL Server Version 7.0 in which the system administrator password is blank, the default setting for that release. Microsoft issued a bulletin to enterprise customers after it, too, noticed an increase in the number of attempts to access SQL Servers that have blank passwords. It recommended a series of steps, the first being to make sure no system administrator passwords remain blank.

COMPENDIUM

Just the FAQs

Law.com reports a judge has ruled you can't copyright the answers to frequently asked questions. The case involved the Web sites of dueling companies that give people faux tans by squirting them with bronzing fluids; the judge said "the format of a Frequently Asked Questions page is a common idea in our society."

Get more vitally important information like this every day; see Compendium: www.nwfusion.com, DocFinder: 9356.

Vulnerability flagged in Cisco IP phones

■ Weaknesses in some models of Cisco IP telephones could let the devices be restarted by a Web attack or even taken over by a malicious network client, the company says. A Web-based attacker using common denial-of-service programs could cause a Cisco IP phone to restart, ending any call in progress. Phones also could be restarted using invalid HTTP requests to a Web server running on certain IP phone configurations. The vulnerability affects Cisco 7910, 7940 and 7960 IP phones, which are used with the vendor's Architecture for Voice, Video and Integrated Data IP telephony phone system, based on CallManager software. A software fix is available on Cisco's Web site. Cisco was the leading seller of IP phones last year, according to Cahners In-stat/MDR, and the company has an installed base of more than 500,000 IP phones and 6 million-plus voice-over-IP system ports.

Database management market growing

■ Despite the setbacks that last year's tight economic environment caused, worldwide sales of relational and object-relational database management systems are poised to surge again, growing to a $20 billion market by 2006, according to an IDC report released last week. Although widespread IT spending cutbacks in 2001 left RDBMS vendors focusing on midsize customers rather than high-end clients, the market will mature as service providers start to increase buying in 2004, IDC said. However, the market landscape has changed because of last year's tough economic climate, with some smaller vendors having to close, and industry stalwarts such as Progress Software staying in the game, according to IDC. Additionally, vendors with solid tracks in the middle market fared better than those dependent on large contracts, given spending cutbacks and contract cancellations.

Intel lays out $50M for New Focus

■ Intel has agreed to acquire the tunable laser business of New Focus to jump-start its development of lower-cost optical network equipment. The purchase for about $50 million in cash will let the chip maker build smaller, less-expensive optical transceivers, which are used to deliver data over telecommunication networks, Intel says. Specifically, the tunable lasers allow these optical transceivers to increase the bandwidth in existing fiber networks using dense wavelength division multiplexing. Intel aims to lower the cost of DWDM equipment that lets service providers add bandwidth to their optical networks without adding new fiber.

■ TheGoodTheBadTheUgly

Bargain shopping. A new Gartner/Goldman Sachs report of 389 IT executives found that half of those surveyed say their ability to command favorable pricing terms with vendors has increased this year. The trick, of course, is to squeeze the vendors, but not so tight that they go out of business.

Join the crowd. "[I]n growing the business we, along with others in the industry, outpaced the demand and, as a result, are overbuilt," said John Gerdelman, CEO of Metromedia Fiber Network, in announcing the company's decision last week to file for Chapter 11 bankruptcy protection. Gerdelman, like so many of his counterparts who have filed for Chapter 11, swears his company will make a comeback.

Funny money? Former executives at software makers Unify, Quintus and Legato Systems last week were charged separately with financial fraud by the Securities and Exchange Commission, which seems to have made it into the pages of *Network World* more often of late than some of the top network industry players.

Meet Chen. Globe-trotting Dealmaker.
Virtual Team Virtuoso.

And the impetus behind the
interactive multimedia movement.

They're everywhere. Clicking PDAs to access vital information. Dialing cell phones to download e-mail. Logging on to laptops to communicate anywhere on the planet. It's the Chens of the world who are turning business on the move into business as usual. And it's Nortel Networks™ that develops the technology to meet the challenges of mobility and helps businesses generate revenue. For instance, integrated multimedia technology from Nortel Networks enables companies such as Chen's to communicate via video calls, voice mail, e-mail, and faxes over any device and any network. Whether Chen is in the office or on the road, he's always in touch. So, he doesn't have to find information to stay productive and competitive – it finds him. And with Nortel Networks Optical Ethernet-based network hosting solutions, service providers can manage the delivery of these services so Chen can focus on his core business. Just one more way Nortel Networks is making the Internet what you need it to be. nortelnetworks.com/multimedia

Gartner names Nortel Networks Leader in Converged Voice/Data*

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RealNames' fall may doom keywords

BY CAROLYN DUFFY MARSAN

When keywords became available in Microsoft's Internet Explorer two years ago, they offered companies a simpler way for their customers to find information about their products and services on the Web.

Now the recent closure of RealNames, the Internet's premier provider of keywords, leaves the technology's future in doubt even as the Internet Engineering Task Force (IETF) is finalizing a standard for resolving keywords.

Major corporations such as IBM, eBay, Ford, Bank of America and Xerox use RealNames' keyword service, which will remain operational until June 28, to help customers find product information on their Web sites. For example, a user could type the keyword "ThinkPad" in the browser command line and go directly to the appropriate page of IBM's Web site without needing to know the corresponding URL.

However, the technology's greatest promise was in resolving queries for non-English language domain names, especially in such complex languages as Arabic, Japanese, Chinese and Korean. Among the Asian companies that used RealNames' keyword service to ease user navigation were Sony, Nomura Security and Haier Group.

"The closure of RealNames, the company, is fundamentally a measure of business-level process, not a statement about keyword technologies," says Leslie Daigle, chair of the Internet Architecture Board and leader of the IETF's keyword resolution effort. "It has more to do with decisions made in various boardrooms than whether people want, or will supply, keyword services."

RealNames ceased operations May 13 after Microsoft chose not to renew a contract to distribute the RealNames keyword service with its browser. Microsoft made this decision even though it owns 20% of RealNames, which is in the process of liquidating assets.

Also losing out in this surprise turn of events is VeriSign, which owns 10% of RealNames and was a reseller of its keywords. VeriSign plans to write off an $18 million investment in RealNames and must come up with another solution for resolving the 1 million foreign-language domain names it has registered.

RealNames founder and CEO Keith Teare says the company was at a break-even point and has $12 million in cash. The company owes Microsoft approximately $25 million and plans to sell its physical and technological assets related to directory services, multilingual domain name resolution and messaging services.

"We put all our eggs in one basket very consciously," Teare says. "With Microsoft as a 20% shareholder and with significant revenue share going to Microsoft, we thought it was a pretty safe basket."

RealNames had sold more than 200,000 brand-name keywords. During March, RealNames' keywords were accessed 187 million times, company officials say.

"Keyword technology is being killed by Microsoft, and it has absolutely no chance of being recreated unless they're prepared to help," Teare says. "Their browser is used by a half-billion people, and it sits between the user and the content. If their applications don't support keywords, then keywords don't exist."

Keywords are "the human-facing component that the geeks who built the Internet forgot to make," says Michael Mealling, an engineer with VeriSign who helped author several IETF documents related to keyword resolution. "The Internet really became popular before we finished the thing. And it was used primarily by geeks who didn't have a problem with [long HTTP addresses]. So now that our grandmothers want to use it, we have to build that human component into it."

The demise of RealNames leaves only a few small keyword providers standing: the U.K.'s CommonName, a Chinese portal-based keyword system called 3721 and a Korean-language service called Netpia. Meanwhile, AOL Time Warner offers a proprietary keyword service to its users.

Companies spent $500 per year to register a RealNames keyword, with volume discounts available for large customers such as eBay, which had about 3,000 keywords in the RealNames system. These large customers paid RealNames from $50,000 to $500,000 per year.

Supporters of keyword technology say RealNames failed in part because it was a closed, proprietary service offered by a single company.

Ironically, RealNames is closing just as the IETF appears ready to approve a standard for keyword resolution. RealNames engineers helped create the standard, which is called the Common Name Resolution Protocol (CNRP). Daigle, who served as chair of the CNRP working group, says the IETF's leadership has approved the CNRP documents and will publish them soon.

Whether a new player will enter the keyword market remains to be seen. RealNames executives were angered last week by the discovery that Microsoft recently was awarded its own patent for a keyword system. Microsoft declined to comment about the patent it has on keywords.

Some observers predict new keyword services will be hard to finance in today's economic climate.

"Keywords is another layer above the basic resolution. It is an option. So the key question is: Do we really need it?" asks Marc Blanchet, co-chair of the IETF's Internationalized Domain Name working group and an engineer with Viagenie. "This is a great technology but . . . some technologies that are not essential sometimes never get the market [support]." ■

PROFILE: REALNAMES

Location: San Carlos, Calif.

Founded: 1997

Original name: Central Corp.

Products: Keyword registration and resolution service.

CEO: Keith Teare

Financing: Venture capital raised $133M in four rounds; Microsoft 20%, VeriSign 10%.

Status: Ceased operations, liquidating assets.

Vendors push for open storage mgmt.

Consortium proposes a management technique for Fibre Channel devices.

BY DENI CONNOR

MOUNTAIN VIEW, CALIF. — A consortium of 17 of the leading storage-area network vendors, including Hewlett-Packard, EMC, Dell, Computer Associates and IBM, has submitted a proposal for a standards-based, heterogeneous management of Fibre Channel devices that analysts say is a huge technology leap for managing any vendor's storage device.

Dubbed Bluefin, the specification was given to the Storage Network Industry Association with the hope that SNIA would push a standard out quickly.

Bluefin is based on the same Web-based Enterprise Management (WBEM) initiative and includes the same Common Information Model (CIM) data model and transport mechanism that the Desktop Management Task Force (DMTF) recommends for managing network and storage devices.

For several years, users have relied on proprietary management software supplied by the vendor of their storage device.

For standards, they have only had SNMP, which discovered, monitored and performed limited configuration, but which wasn't hefty enough to take the place of the proprietary software and manage any storage array or switch, regardless of vendor implementation.

"SNMP doesn't provide anywhere near the level of detail required to discover, monitor and configure storage devices," says Kirby Wadsworth, vice president of marketing at Storability, a company that provides storage management software and services.

But WBEM and CIM, when combined with proprietary management packages from storage vendors, will let users configure, manage and redeploy storage devices, irrespective of vendor, analysts say.

"Bluefin is good to the extent that we have a standard that is at least moving in the right direction," says Jamie Gruener, senior analyst with The Yankee Group. "Right now though, without WBEM/CIM, we have no way to achieve heterogeneous management with all the proprietary vendor APIs [such as EMC's WideSky] out there."

Observers expect that Bluefin will be like many other standards, for which building to the lowest common denominator rules. They expect vendors will continue to bolt on existing proprietary APIs that let their customers manage a specific storage vendor's boxes better.

According to an EMC spokesman, that is exactly what the storage giant will do — use WBEM/CIM as a framework for management, with WideSky extensions that manage the company's Symmetrix better.

"We'll take Bluefin and make it a part of WideSky," says Mike O'Malley, an EMC spokesman. "Bluefin and CIM only address one piece of the pie. With luck, going forward they will address more, but right now WideSky does things that Bluefin doesn't."

A bigger problem than heterogeneous storage management is the standardization process, Gruener says.

"The [Bluefin] vendors are going through a relatively paralyzed standards body [SNIA]," Gruener says. He adds that an organization such as the Internet Engineering Task Force (IETF), which can accelerate the standardization, should take over for SNIA's inadequacies.

SNIA originally submitted a CIM-based storage proposal to the DMTF in 1999; until this spring, when demonstrations of CIM-managed storage took place at Storage Networking World, little has happened with CIM under SNIA's supervision. That is unlike the iSCSI and Fibre Channel over IP specifications, which were submitted directly to the IETF in 2000; they are expected to achieve standards status this year. ■

Storage
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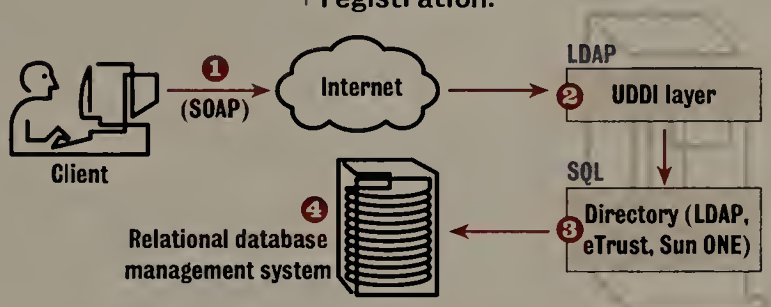
Vendors to link directory to Web services

■ BY DENI CONNOR

CA's UDDI plans

Computer Associates is one of three companies with a plan to have directories take a role in UDDI registration.



①
(SOAP)
Client
Internet
LDAP
② UDDI layer
SQL
③ Directory (LDAP, eTrust, Sun ONE)
④
Relational database management system

① A business customer accesses the UDDI registry using Simple Object Access Protocol (SOAP) to register his company's Web services.

② The UDDI layer mediates between the SOAP implementation of UDDI and the LDAP interface.

③ LDAP authenticates the customer to the underlying relational database and controls the management of the connection and replication.

④ UDDI information is stored in the relational database, where it can be backed up and recovered.

Three industry heavyweights are pushing competing plans for standardizing the way Web services information is secured, managed and distributed inside and outside corporate firewalls.

In unrelated efforts, Novell, Sun and Computer Associates are proposing that various directory technologies be used for building and improving Web services registries, as opposed to relational databases used today:

- Novell submitted a draft in February to the Internet Engineering Task Force (IETF) that calls for Lightweight Directory Access Protocol (LDAP) to be used, and is working on a product called UDDI Services for release later this summer. Universal Description, Discovery and Integration (UDDI) is a standard for building distributed Web-based registries that provide a "phone book" listing of companies and services they provide.
- CA will introduce a product late this year that uses its eTrust directory as a platform for managing and replicating Web services with databases within firewalls.
- Sun is readying a UDDI registry services product for release early this summer that will use its Sun ONE directory as a repository for UDDI data within firewalls.

Web services range from a collection of dynamic XML-based applications that can be located and executed over the Internet to simple interfaces for integrating unlike systems. The UDDI Community, the organization that provides a registry of these services, doesn't care which underlying infrastructure is used — whether it is an SQL database, XML database or directory.

"The UDDI Community has no particular view on how people implement the specification," says Siva Darivemula, market manager for WebSphere Strategic Business Initiatives at IBM and a member of the marketing committee for the UDDI Community.

Users and analysts have mixed opinions on how implementation should take place.

Peter Strifas, senior directory engineer for Mount Sinai-New York University Health Organization, says he sees advantages of directory and relational database technologies.

"I can run [a relational database] on some very reliable hardware so it's very highly scalable," Strifas says. "But, with Novell's DirXML and eDirectory, I can set up a directory tree to handle UDDI services and manage it via traditional tools and processes. That would be an advantage to installing a relational database with an XML layer on top, which would require specialized skills my organization may not have available."

Novell, Sun and CA say that directories already provide some of the capabilities that need to be bolted on to databases — features such as integrated resource management, authentication and access control, and replication and synchronization services that affect the global distribution of information.

"With a registry, you write to it a few times, read it a lot and need to have high-speed and secure access to it and the ability to replicate it," says Winston Bumpus, director of standards at Novell. "This is what directories are designed to do."

Don LeClare, vice president in CA's Office of the CTO, agrees.

"If you look at the kinds of structures UDDI registries have, they are basically multilayer hierarchies where you define your company and the services you offer," LeClare says. "Relational databases are not particularly well-suited to doing queries across hierarchies, so you have to do a lot of work that does those queries in a scalable, very fast way."

The current UDDI registries posted by IBM, Microsoft and Hewlett-Packard use relational databases to store information. ■

■ Read our Tech Update about how UDDI is considered the Yellow Pages of Web services. PAGE 41.

USi climbs out from the depths of Chapter 11

Even with a pending merger and a cash infusion, company still faces familiar challenges.

■ BY JENNIFER MEARS

ANNAPOLIS, MD. — USinternetworking has emerged from Chapter 11 bankruptcy protection, fewer than five months after going in, with significantly reduced debt, an $81 million cash infusion and plans to merge with rival application service provider Interpath.

While it's good news for the ASP market, industry observers note that USi still faces the same hurdles it struggled with before getting the promise of a lifeline last fall from Bain Capital, which holds a majority share in Interpath. For one thing, USi plans to hold on to its data centers, which it built to offer end-to-end service to enterprise customers, saddling it with millions of dollars in debt. For another, the company offers a range of applications, which some analysts say dilutes its focus.

What's different is that the ASP now has a stronger balance sheet, cash in the bank and an expanded customer base through its merger with Interpath. In addition, all signs point to better days ahead for ASPs, with IDC predicting that revenue for the industry will reach nearly $20 billion by 2006.

At the same time, USi is committed to a business model that hasn't panned out for many of its competitors. "This particular model, where you're providing application services and management and hosting for third party applications that you don't own and control and you're doing it for a variety of different brands … is the hardest one to make work," says Laurie McCabe, a vice president at Summit Strategies.

ASPs with different approaches, such as SalesForce.com, Upshot and Employease, which peddle Web-native applications, and companies such as AppShop, which focus on a single third-party application, are having a much easier time, McCabe says. Still, USi "is in better shape than they were," McCabe adds.

> **"As of today, customers of both companies are customers of a far, far more financially secure entity. And to the extent that they were worried about long-term viability, that worry can go away,"**
>
> **Andrew Stern**
> CEO, USi

USi announced last week that it completed its restructuring as part of a prenegotiated deal with Bain Capital to erase a majority of its debt in order to receive up to $106 million in funding from the private equity firm. USi went into the Chapter 11 proceedings with some $210 million in debt on its books and emerges with $70 million in obligations.

It also comes out of bankruptcy protection with $81.3 million in equity funding from Bain and an agreement to merge with debt-free Interpath. Bain will own a majority of the combined company once the deal is complete, says USi CEO Andrew Stern, who will become chairman and CEO of the merged entity.

Both companies will continue to conduct business under their respective names as executives decide how to brand the new company, Stern says. The firm, which will be private and based at USi headquarters in Annapolis initially will employ 700 people, 520 from USi and 180 from Interpath, based in Research Triangle Park, N.C.

The company will have 130 customers, 100 from USi, and combined revenue of nearly $150 million in 2001, making it one of the top-performing ASPs in the market, analysts say. USi led the ASP market in 2000 with about $100 million in revenue, according to IDC.

"As of today, customers of both companies are customers of a far, far more financially secure entity. And to the extent that they were

See USi, page 14

New tools available for managing patches

■ BY JOHN FONTANA

Patch and security management are hot buttons these days for network executives, and vendors are scrambling to respond.

This week, Shavlik Technologies will release EnterpriseInspector 2.0, software that features remote scanning, centralized data storage and reporting tools for evaluating patch installations and security vulnerabilities in Windows-based systems.

Shavlik and Microsoft co-developed the technology. Microsoft released a version called Baseline Security Analyzer (MBSA) in April, but Shavlik is adding a database component that pulls all security information into one repository for centralized management. It is the first release of the tool for Shavlik, despite the 2.0 moniker.

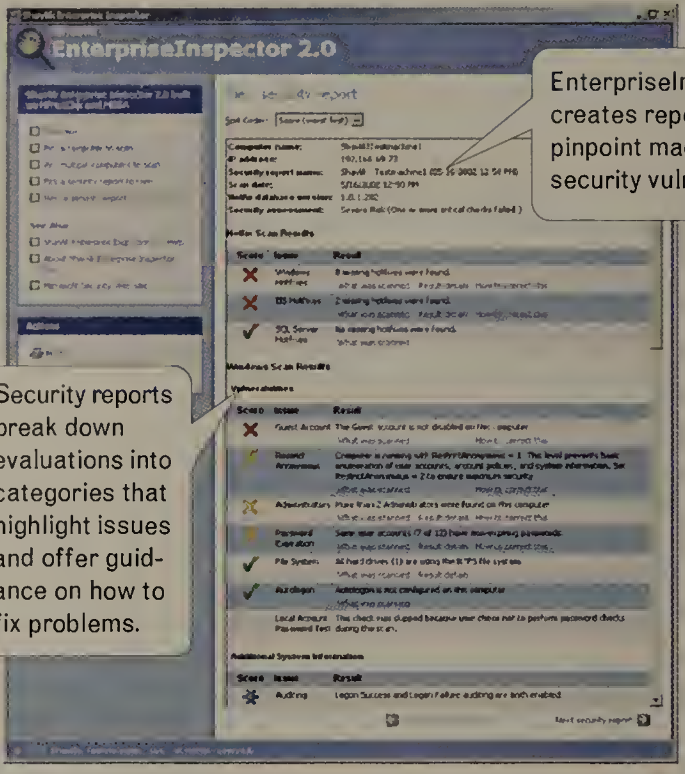
"Patch management is our No. 1 issue for maintaining a baseline of security with Microsoft products," says Andrew Nielsen, senior multidisciplinary technologist with Raytheon Technical Services in Moffett Field, Calif. "Microsoft makes it a bit harder to patch because they don't have a 100% reliable single place you can go to get patches. There's no panacea to patch management but some of these tools are making it easier."

Nielsen says he uses a number of tools and Shavlik's EnterpriseInspector offers capabilities that can function across his network.

Shavlik's release comes a week after management service provider Loudcloud introduced a patch-management service. The service, which is part of Loudcloud's Managed Services Version 3.0, automatically detects vulnerabilities in software from more than 200 vendors and delivers the correct patch. It also lets network executives test patches before installation.

Security checks

Shavlik Technologies' EnterpriseInspector 2.0 allows for customizable security analyses based on specific vulnerability scans.



EnterpriseInspector creates reports that pinpoint machines with security vulnerabilities.

Security reports break down evaluations into categories that highlight issues and offer guidance on how to fix problems.

"Security exploits and incidents end up being human error in that patches don't get installed," says Pete Lindstrom, director of security strategies for Hurwitz Group. "All these [patch] tools are blocking and tackling. Security's not sexy, but it is necessary."

Shavlik and Loudcloud compete with tools from BigFix, St. Bernard Software, ConfigureSoft, Ecora, Aelita, Patchlink and others.

While human error can be to blame for security vulnerabilities, Microsoft customers have been highly vocal lately after two incidents showed Microsoft's patch-management services, tools and download sites sometimes offer conflicting data that could leave systems vulnerable to security breeches. At issue were inconsistencies in installation details reported by Windows Update, an online automated patch-update service, and HFNetChk, a free patch-management tool Microsoft licenses from Shavlik.

Shavlik says it hopes to minimize the consistency issue. EnterpriseInspector 2.0 pulls all its patch data from a single source — Microsoft's XML Security Database, a repository of new and existing patches. It's the same database Microsoft's TechNet site uses to distribute patches. Windows Update uses a different security database. The two databases have helped foster the inconsistency problems.

EnterpriseInspector 2.0 scans for missing security patches, weak passwords or bad configurations across servers and applications. It inspects Internet Information Server, SQL Server, Office, Outlook and Internet Explorer without having to install any agent software on desktops or servers. It uses Shavlik's popular HFNetChkPro to monitor security patches. The collected data is transported in an XML format to a secure database.

Once centralized, security auditors can generate reports on the supported systems, as with MBSA. Shavlik has added seven reports with features such as analysis by machine, domain or ranges of IP addresses.

"We add a management element that is not there with MBSA," says Mark Shavlik, founder of the company. He says EnterpriseInspector software can be customized or enhanced with add-on tools.

The software is priced at about $7,900 for up to 250 managed computers including a year of support and upgrades. Existing HFNetChkPro customers receive a 50% discount.

Shavlik: www.shavlik.com

Citrix boosts Web-based apps access

■ BY JOHN COX

FORT LAUDERDALE, FLA. — Citrix Systems last week unveiled features for its flagship MetaFrame software designed to give end users more tailored Web access to a range of server applications.

MetaFrame software lets client devices connect to and run applications that are loaded on Windows NT/2000 or Unix servers. Network executives can centralize and manage applications on groups of servers, instead of on hundreds or thousands of PCs.

MetaFrame XP for Windows Feature Release 2 includes a program called NFuse Classic, which lets authorized users view and activate applications by means of a Web browser instead of a full-blown Windows client application. Citrix has a forthcoming portal product, NFuse Elite, designed to create a single, Web-based point of access to an array of corporate applications.

The latest MetaFrame feature release lets administrators add to a user's NFuse Web page, a set of application icons that are drawn from different groups of MetaFrame servers. Regardless of where the application resides on the network, it appears to be a "local" application to each user.

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Another change that improves the Web interface is called content redirection. With this feature, a user clicks on a PC file, and MetaFrame moves the file to the server that has the application that can run it.

Citrix now bundles its Secure Gateway with MetaFrame. Clients connect to the gateway via Secure Sockets Layer, and the gateway handles encryption and protocol translation via a single port through the firewall to one or more MetaFrame servers. In the past, there had to be one firewall port for each MetaFrame server.

A MetaFrame enterprise starter system, which includes 20 client licenses, has a suggested retail price of $8,000, including the Citrix software upgrade service called Subscription Advantage.

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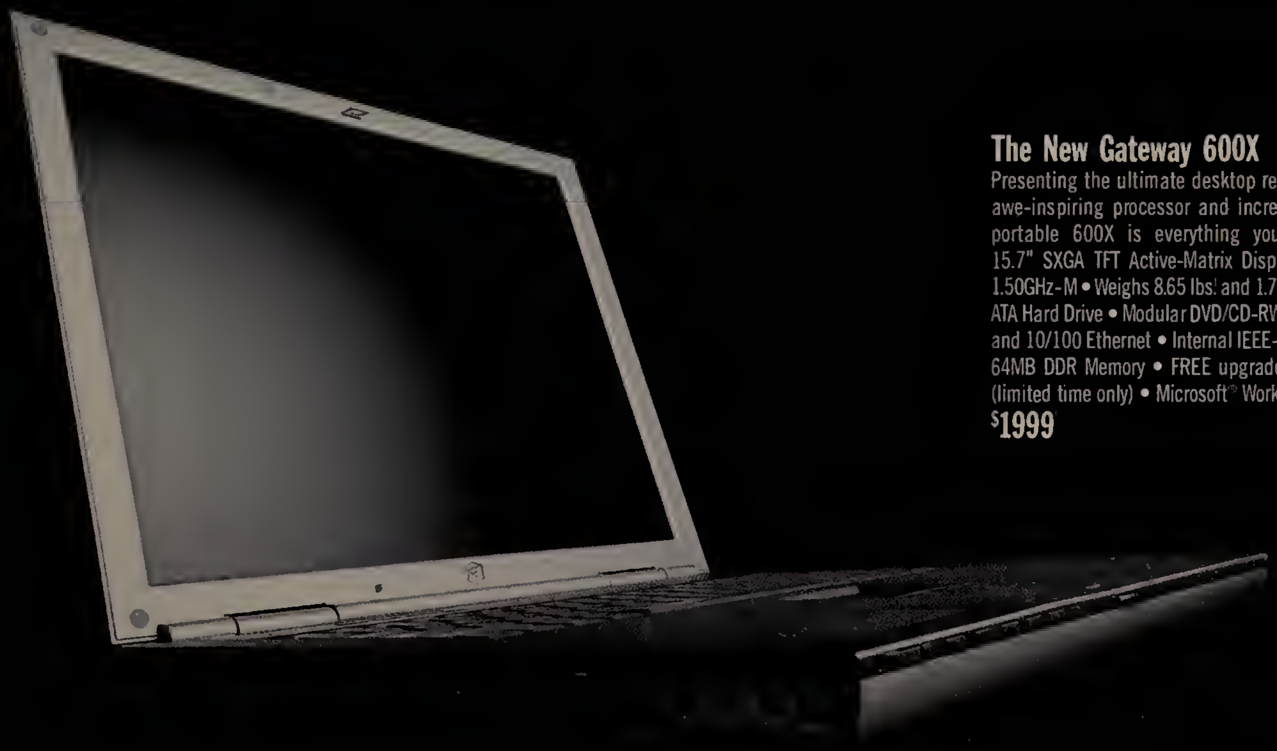

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Start-ups

continued from page 1

and sparse acquisition activity, venture capitalists have few options other than to continue financing an aging crop of not-yet-profitable companies or shut them down.

The trend has ramifications for corporate IT buyers who will see more hardware and software suppliers depend on uncertain venture financing for ongoing product development. These buyers should ask pointed questions about their suppliers' financial situation, experts say.

"In some cases, venture capitalists are trying to prop up investments that for whatever reason are not doing well or haven't done well in the past," says Jesse Reyes, vice president of Venture Economics, a market research firm. "When I start looking at companies that are this old and still receiving financing . . . it bothers me a bit. If they haven't gotten it right yet, I wonder if they will ever get it right."

During the first quarter, 50 network start-ups closed their sixth or higher financing round, including such up-and-comers as IntelliSpace, a New York metropolitan Ethernet provider, and Response Networks, a North Andover, Mass., network management software vendor, according to the Money Tree Survey compiled by PricewaterhouseCoopers, Venture Economics and the National Venture Capital Association. These 50 cases represent 13% of the 387 network industry deals closed during the quarter.

"The real question is not how much money have venture capitalists deployed, but how much new money is being deployed," says Marco Rubin, managing director of Monumental Venture Partners, a Vienna, Va., firm that began investing in network start-ups in 2001.

There are a lot of ongoing investments in companies with sinking valuations "being dressed up to look like something else," Rubin says. "There's a lot of toxic stuff out there. We're lucky we don't have the taint of the last two or three years."

Not all companies that have received six or more rounds of financing are in trouble, experts say.

"What you can say about these situations is that there was probably something troubling in the past," says Steve Bengston, managing director of emerging company services at PricewaterhouseCoopers. "No one would invest in a company knowing it would take 10 rounds. . . . But the fact that in this market they're raising money is a strong endorsement of where they are now."

Many of the companies continuing to receive venture financing are quite old.

Take Visual Edge Technology, a San Jose maker of high-performance controller software and hardware. The company has received financing from New Enterprise Associates (NEA) for 16 years. How many rounds of financing the company has received depends on whom you ask: NEA says it has contributed nine rounds, while the Money Tree Survey records 31 rounds.

The discrepancy is because the Money Tree Survey counts each cash infusion as a separate round of financing, while many companies count their rounds more conservatively. Within the start-up community, it's considered more prestigious to have received fewer, larger rounds of financing than many, small rounds.

While Visual Edge Technology is an extreme example, the company is not alone.

Teloquent Communications, a Billerica, Mass., provider of call center software, has received venture financing since 1989. The company raised $2.5 million in January, in what it calls its 10th round of financing and what the Money Tree Survey counts as its 15th round.

"If you go back to the beginning of 2000, we thought we'd do a mezzanine round and take the company public," says Bruce Bower, Teloquent's CEO. "We were early in the distributed call center business. . . . We didn't realize that this market needed a long, long runway."

Teloquent is dependent on venture financing even though it has mature software and 150 customers, including IBM, Hitachi and ADP Dealer Services. Bower says Teloquent is a break-even business but needed additional money to invest in its software until the stock market turns around.

VCs fund aging 'start-ups'

Later rounds of financing have become commonplace.

Company	Founded	Most recent round	Amount
Visual Edge Technology	1986	31	$600K
Teloquent Communications	1989	15	$2.5M
HAHT Commerce	1995	10	$6M
Entegrity Solutions	1996	9	$2.8M
iReady	1996	9	$19M
LiveVault	1993	9	$4.5M

*Each cash infusion is considered a separate round.

SOURCE: MONEYTREE SURVEY

When asked if this will be the company's last round of financing, Bower laughs and says: "We certainly hope so."

Many of today's later-round deals involve companies that have been restructured with a new strategy, management team or both. Most of these companies have undergone what's called a down round, where the valuation of the company had gone down over time, vs. going up as was common during the network industry glory days of 1998, 1999 and 2000. With down rounds, later-stage venture capital investors get a bigger share of the remaining company and early investors lose out.

"Not many companies have done 10 rounds or more where all of the investors did well," Bengston says. "But there are quite a few examples of companies that have raised lots of rounds where the later-stage investors did extremely well. In companies that have done a restart, many early investors get washed out."

That's what happened to HAHT Commerce, a Raleigh, N.C., provider of e-commerce software founded in 1995. HAHT's software is in its seventh release and includes Dow Corning, Hasbro and Minolta among its customers.

Earlier this year, HAHT raised $6 million in what it calls its eighth round of financing and the Money Tree Survey counts as its 10th round. HAHT originally planned to make an IPO of stock in 2000 but shelved those plans when the stock market started to decline.

"We recapitalized the company," explains company spokesman Bob Gallagher. "We took all the existing [venture capital] investors in the A, B, C, D, E and F rounds and got rid of the priorities they had and turned their investments into common stock."

Gallagher says the company has raised two rounds under its new financial structure, including the latest investment from Canaan Partners.

Another restart was iReady, a Santa Clara manufacturer of embedded IP processors that changed its target market from home appliance manufacturers to network equipment vendors. Founded in 1996, iReady received $19 million last quarter in what it calls its fifth round and the Money Tree Survey calculates as its ninth round.

Steve Bach, iReady's CFO, says its latest round included financing from National Semiconductor, which also licensed iReady's technology.

"Restarts only make sense if there's something that fundamentally changed in your business," Bach says. "We have some great core technology and the patents to protect it. Now we're going after a different market."

This trend of network start-ups restructuring themselves and getting later rounds of financing is expected to continue through this year.

"There is a large pipeline of companies in IT and life sciences that have been sitting around for three or four years without an exit strategy," Venture Economics' Reyes says.

"They were too young to go public two years ago," he says. "And they're probably old enough now where they're generating some profits but they have to wait until the exit markets open up."

So many network companies that receive venture financing are more than five years old that it's hard to call them start-ups. PricewaterhouseCoopers has its own term: emerging companies.

"You can't say you're a start-up when your incorporation papers go back as far as ours do," Teloquent's Bower admits. "We consider ourselves a young technology company because of our revenue size." ■

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USi

continued from page 11

worried about long-term viability, that worry can go away," Stern says.

A vice president of e-commerce at a major healthcare firm, who asked not to be named, says his company has been a customer of USi for about two years. He's encouraged by the additional funding and the merger with Interpath. "They can go back to focusing on the basics: growing their business," he says of USi.

"My biggest concern over these months was something could go awry in reorganization, so the fact they came out of it is great relief to me," he says. "If you look at the other players out there, in my mind they are one of the best players. They have impressive talent and that's their bread and butter."

USi offers applications from Ariba, BEA Systems, BroadVision, Lawson, Microsoft, PeopleSoft and Siebel Systems. Interpath's hosted applications include Microsoft, PeopleSoft, Pivotal and Vignette. Stern says the integration team is reviewing the applications to determine what will stay.

Overlapping applications, such as PeopleSoft, are destined to stay, Stern says, giving the combined company a boost in certain areas.

"They'll have a pretty strong client base for PeopleSoft, that's for sure," says Amy Mizoras, an analyst at IDC. When customers look to sign up with a service provider one of the things they're looking for is experience with the application." ■

Infrastructure

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- ROUTERS ■ HUBS
- ACCESS DEVICES ■ CLIENTS
- SERVERS ■ OPERATING SYSTEMS
- VPNS ■ NETWORKED STORAGE

Short Takes

■ While the worldwide Ethernet switch market shrank last quarter, market leader **Cisco** increased its share of the pie by 6%, while **3Com** saw its Gigabit Ethernet business skyrocket, according to recent figures from Dell'Oro Group. The $2.65 billion in worldwide sales of Ethernet switch ports in the first quarter was down 4% from the previous quarter. Cisco took the opportunity of the down market to increase its share of switch sales. Most other vendors, with exception of **Extreme Networks,** lost share during the quarter. Cisco increased its market share from 60% of Ethernet switch port revenue in the fourth quarter of 2001 to 66% in the first quarter of 2002. Nortel remained a distant second with 5.7% of the market, down 1.8% from the previous quarter. 3Com and Extreme were tied for third with around 4.2% of the market each. Recent administrative shakeups and financial troubles at **Enterasys Networks** were reflected in terms of market share, as the company fell out of the top three vendors with less than 3% market share, down 2% from the fourth quarter of 2001, when it was in third-best seller of Ethernet switches.

■ **Dell** and **Gateway** last week announced systems with updated hardware from Intel, including Gigabit Ethernet capability. Gateway will offer Intel's new 845GL chipset and six Universal Serial Bus 2.0 connections with seven machines in its **Gateway 300 series** and **Gateway 500 series.** The systems cost from $650 to $1,500 and are available now. Meanwhile, Dell introduced the **OptiPlex GX260,** which features an Intel Pro/1000 MT Gigabit (10/100/1000) Ethernet controller. An entry-level version of the GX260, with a 1.7GHz Intel Celeron processor, 128M bytes of Dual Data Rate Synchronous Dynamic RAM, and a 20G-byte hard drive costs $750. Dell also is including the **Open-Manage Client Administrator,** a management tool designed to facilitate software deployment.
www.dell.com; www.gateway.com

WideRay beams data to handhelds

■ **BY JOHN COX**

SAN FRANCISCO — Wireless server vendor WideRay last week introduced a device that lets users with Pocket PC and Palm OS handhelds access information via the widely installed, but rarely used, infrared interface found on most devices.

By connecting via infrared to a hand-sized server, called the Jack, Pocket PC users can access whatever Web information has been deployed for them at a given site: product catalogs, pricing data, human resources information.

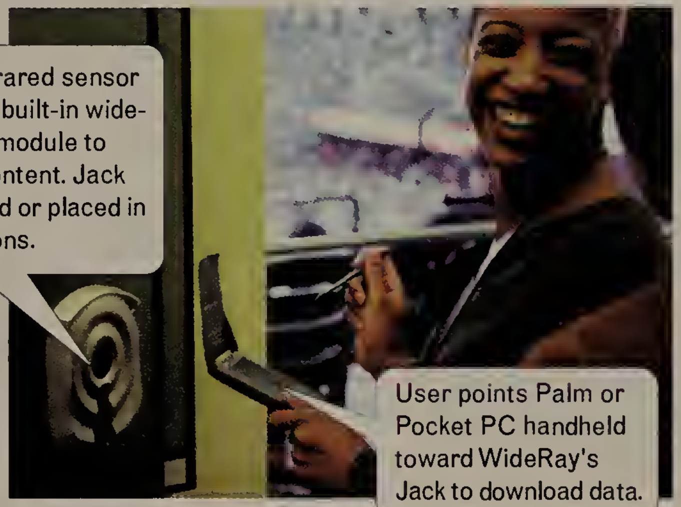
The 6-by-5-by-2-inch device weighs 20 ounces and has a lithium-ion battery pack, so it's completely self-sufficient. The Jack is equipped with a microprocessor, 4M bytes of memory cache, server software, a downloadable viewer and WideRay's patent pending high-speed, multicasting infrared protocol, which supports the Infrared Data Association (IRDA) protocol.

WideRay added to IRDA so users can connect to the Jack from 15 feet away (instead of 3 feet). With a more powerful infrared transmitter, the Jack can send out one-way bursts to 150 feet. Another addition lets the Jack transmit at the same time to numerous clients, instead of the one-to-one infrared beaming that is typical of IRDA.

See Infrared, page 18

That's a fact, Jack

WideRay's Jack wireless caching server beams Web content to handhelds. The unit comes with the wireless module, local infrared transciever, microprocessor and cache. Jack also can integrate with wireless LANs and point-of-sale systems.



The Jack's infrared sensor connects via a built-in wide-area wireless module to hosted Web content. Jack can be mounted or placed in various locations.

User points Palm or Pocket PC handheld toward WideRay's Jack to download data.

Vendors put storage nets to the test

Tools from Empirix and Finisar check network performance, data integrity.

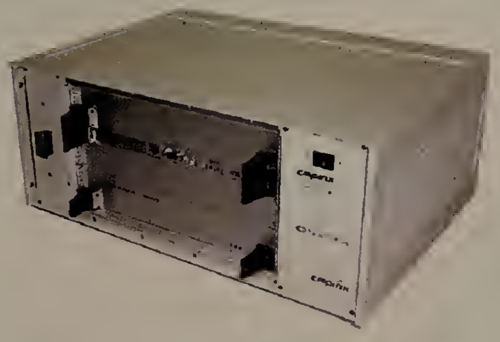
■ **BY DENI CONNOR**

Users who want to evaluate the performance and integrity of IP storage technologies before they install them could be interested in gear Empirix and Finisar introduced recently.

Empirix, a vendor of network test equipment, is launching the PacketSphere Storage Test Platform; Finisar is rolling out the GTX Jammer for iSCSI. Both products let IT managers verify the performance and data integrity of IP storage iSCSI and Fibre Channel-over-IP networks.

As iSCSI and Fibre Channel over IP are just beginning to be implemented, it is appropriate for customers to test IP storage configurations for performance, throughput and interoperability before deploying them so they can avoid the interoperability problems that plagued Fibre Channel storage-area network (SAN) adoption, experts say. Using a device such as the PacketSphere or GTX Jammer lets this happen.

PacketSphere is a hardware device that can simulate physical layer network traffic and determine its effect on throughput, performance and quality. For example, the PacketSphere device sits between the Fibre Channel gateway to the SAN and the IP network and can introduce test problems such as packet latency, duplicate packets or router congestion into the network that would reduce its performance. The product works on IP storage networks such as iSCSI, Fibre Channel over IP and network-attached storage.



Empirix's PacketSphere is one of the new tools coming out for testing iSCSI, Fibre Channel-over-IP and network-attached storage traffic.

The GTX Jammer for iSCSI also lets an IT manager inject errors into the network to test for data integrity, so they can guarantee that the network will recover without losing data or slowing network traffic. The GTX Jammer connects to the Ethernet network adapter in the server via a 100M bit/sec Fast Ethernet connector and to the SAN fabric. Unlike the Empirix PacketSphere, it changes the composition of the packet and adds erroneous information to test for conditions that could happen in real life.

A bank could use the GTX Jammer to check the veracity of the data. It could detect protocol errors such as invalid cyclic redundancy checks that may indicate that someone changed the contents of a packet.

"In many cases if you go to production without knowing the ramifications the technology is going to have on a larger network, you're going to face some challenges in terms of network outages, saturation, performance issues and ultimately just plain old downtime, which no one really wants," says Jamie Gruener, a senior

See Storage, page 18

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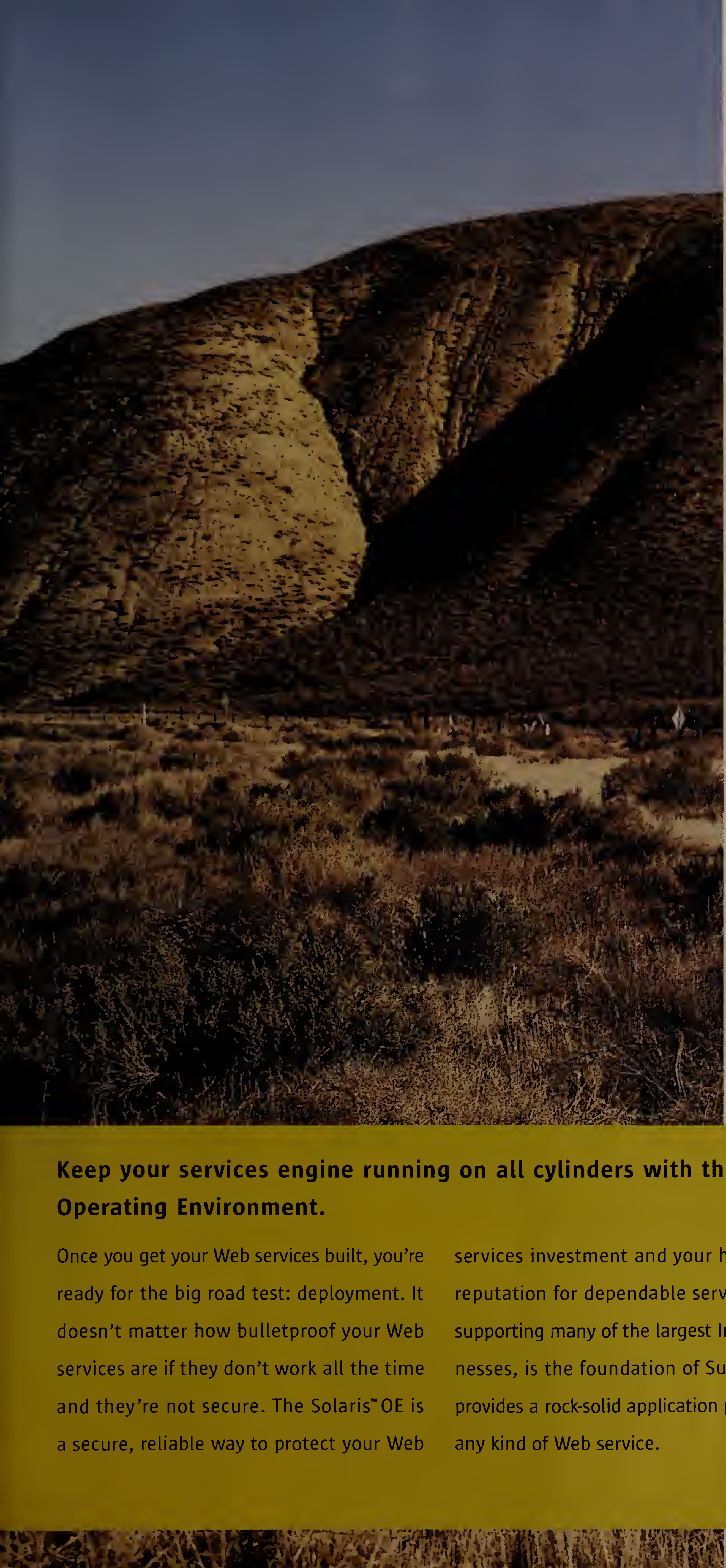

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TOLLY ON TECHNOLOGY

Brian Tolly

Bandwidth or optimization? You make the call

As I walked the aisles at the recent NetWorld+Interop 2002 Las Vegas, I observed that the show floor definitely was not as busy as years gone by and that vendors took a much more tame approach to peddling their wares. Of course there was still plenty of freebie tchotchkes, performances and magic shows (which always puzzles me — why would anyone purchase a product whose catch is that the hand is quicker than the eye?).

Separate from the sideshows, there was quite a diverse thought process on where the technology is headed. On one hand we witnessed the first 10G Ethernet interoperability demonstration at the 10 Gigabit Ethernet Alliance booth. From the components that make up the 10G Ethernet devices to the cable manufacturers and the test tool vendors, all demonstrated their interoperability with the finished products from vendors such as Cisco, Extreme Networks, Foundry Networks and Nortel. These demonstrations show that 10G Ethernet is no longer a fantasy but a reality, and those who need bandwidth can place their orders today.

On the other hand, I also saw a strong showing of vendors whose mantra is, "Why add expensive bandwidth? — Optimize." This class of products ranges from route optimization to content-delivery optimizers. Each vendor focuses on an area in which they have a product that can perform functions more effectively. Route optimization products, for instance, help provide a better end-user experience without growing your bandwidth pipes.

We all realize that throwing bandwidth at a problem may work, but can be an expensive proposition. Instead, vendors such as Route Science and Proficient Networks calculate (via their own proprietary methods) the most effective routes for packets to take. Taking into consideration packet loss and latency, route tables are updated accordingly, aiding in maintaining service-level agreements and providing a type of pseudo-quality of service to ensure data gets the bandwidth it needs in the public network cloud.

Content-delivery optimization products are nothing new — although we did see some new faces in Start-up City. These products assist in taking the inefficiencies out of routine tasks such as HTTP transactions. Here the vendors show why not to spend hefty dollars on expensive Web servers, when there is plenty of life left in existing servers. Through a variety of different methods (usually persistent HTTP connections) these devices sit in front of the server farm and optimize transactions accordingly.

So which method is right? Neither approach on its own represents the perfect solution. Rather a hybrid of the two — bandwidth and optimization — is the right approach for the times. Applications such as voice over IP, a relatively low-bandwidth consumer (yet extremely sensitive to latency), are gaining momentum. And with the economic downturn, costly capital expenditures of items such as Web servers that also come with costly operating expenses (maintenance, personnel, etc.), are not big winners with the decisionmakers. What this means is that optimization products may win in the short term because the emphasis is on cost reduction and maximizing installed investments.

However, down the road, we are seeing the growing demand for new bandwidth-intensive services such as video-on-demand and high-quality video streaming. These applications will require the bandwidth that 10G Ethernet delivers. Of course, before long, undoubtedly someone will come out with the optimizer targeted for 10G Ethernet links. The cycle will just continue to repeat.

What method are you mulling? Drop us a line and let us know.

Tolly is an engineer with The Tolly Group in Manasquan, N.J. He may be reached at btolly@tolly.com.

Radware powers up SSL accelerator

■ BY JENNIFER MEARS

MAHWAH, N.J. — Radware last week introduced a new version of its CertainT 100 Secure Sockets Layer accelerator, which company officials say is geared for businesses such as financial institutions and healthcare organizations that are seeing the number of secure transactions they must support increase dramatically.

The latest version of CertainT 100 will support 1600 secure transactions per second and can be clustered to scale to up to 20,000 transaction/sec, the company says. Radware also offers CertainT 100-400, which supports 450 transaction/sec and the 800, which supports 750 transaction/sec.

By comparison, competitor F5 Networks' BIG-IP SSL Accelerator 800 supports 800 SSL transaction/sec under a heavy load, and 1000 transaction/sec under normal circumstances. NCipher's nFast 800 supports 800 SSL transaction/sec. Both products are server cards, while Radware's SSL accelerator is a stand-alone device. F5 also offers an appliance, called the eCommerce Controller, which supports 1,000 transaction/sec.

The CertainT 100 SSL accelerators speed network performance by off-loading SSL encryption and decryption that can put a drain on Web servers, says Michael Rothschild, product manager at Radware.

The CertainT 100 can be deployed directly in front of Web servers to handle all secure traffic that comes through the network, or it can be clustered and deployed with Radware's Web Server Director load balancer, which will direct secure traffic to the optimal accelerator for encryption and decryption.

Analysts say businesses are looking for SSL accelerators as the amount of secure content on the Internet grows.

"For e-commerce, we see SSL moving beyond just the credit card portion of transactions and being used to encrypt the entire transaction," says Neil Osipuk, directing analyst of e-business infrastructure and hosting at Infonetics Research.

Pricing for the CertainT 100-1600 has not yet been set. ■

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Infrared

continued from page 15

The Jack has a built-in wide-area support: the Motorola Flex Network, which is a paging protocol long supported nationwide by several service providers. In the future, WideRay plans to support other long-distance cellular-based services such as GSM/ General Packet Radio Service, says CEO Saul Kato. Also in the works: radio-based connections to handhelds, via 802.11b and Bluetooth.

WideRay defines typical use for the Jack is for a business customer to use an Internet connection and WideRay's HTML/XML development suite to update Web content on a server hosted by WideRay or by a third party. Then, the hosting service uses the Flexnet paging link to distribute the new content to the specific Jacks, mounted in a company lobby or cafeteria.

Sony Metreon, an entertainment center with theaters, retail shops and restaurants in downtown San Francisco, has five Jacks installed, including a new one, for content related to the "Spider-man" movie. The new Jack is installed in a display window, where passersby can pause and download an interactive game in a few seconds.

"Our guests come back week after week to download our event calendars, movie times, promotional interactive games, and so on," says Archana Elwell, vice president of business development for Sony Metreon. "We can distribute this content with requiring people to go to a URL."

The WideRay Jacks have run flawlessly at Convent of the Sacred Heart, an all-girls high school in San Francisco. Currently, the school updates each of three Jacks separately: An administrator updates daily announcements, homework assignments, various school calendars on a PC and then downloads the data to a Palm handheld. The administrator beams the new information to each Jack.

"What we'd like to do is update our information more than once a day," says Principal Doug Grant. He plans to use future connectivity options from WideRay to link the Jacks to the school's wired network, so content can be updated more often, with less effort.

The updated software, supporting Pocket PC and Palm devices is available now. Typically, Kato says, the monthly charge is about $200 per Jack, but volume discounts are available.

Kato, an ex-Sun technology guru, most recently was founder and CEO of Sven Technologies, which he sold to Spacial Technology. The management team also includes Gerry West, director of hardware engineering, who has in the past 19 years worked for Motorola and Nortel. The firm has also partnered with Motorola, Microsoft and Palm.

WideRay: www.wideray.com

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Storage

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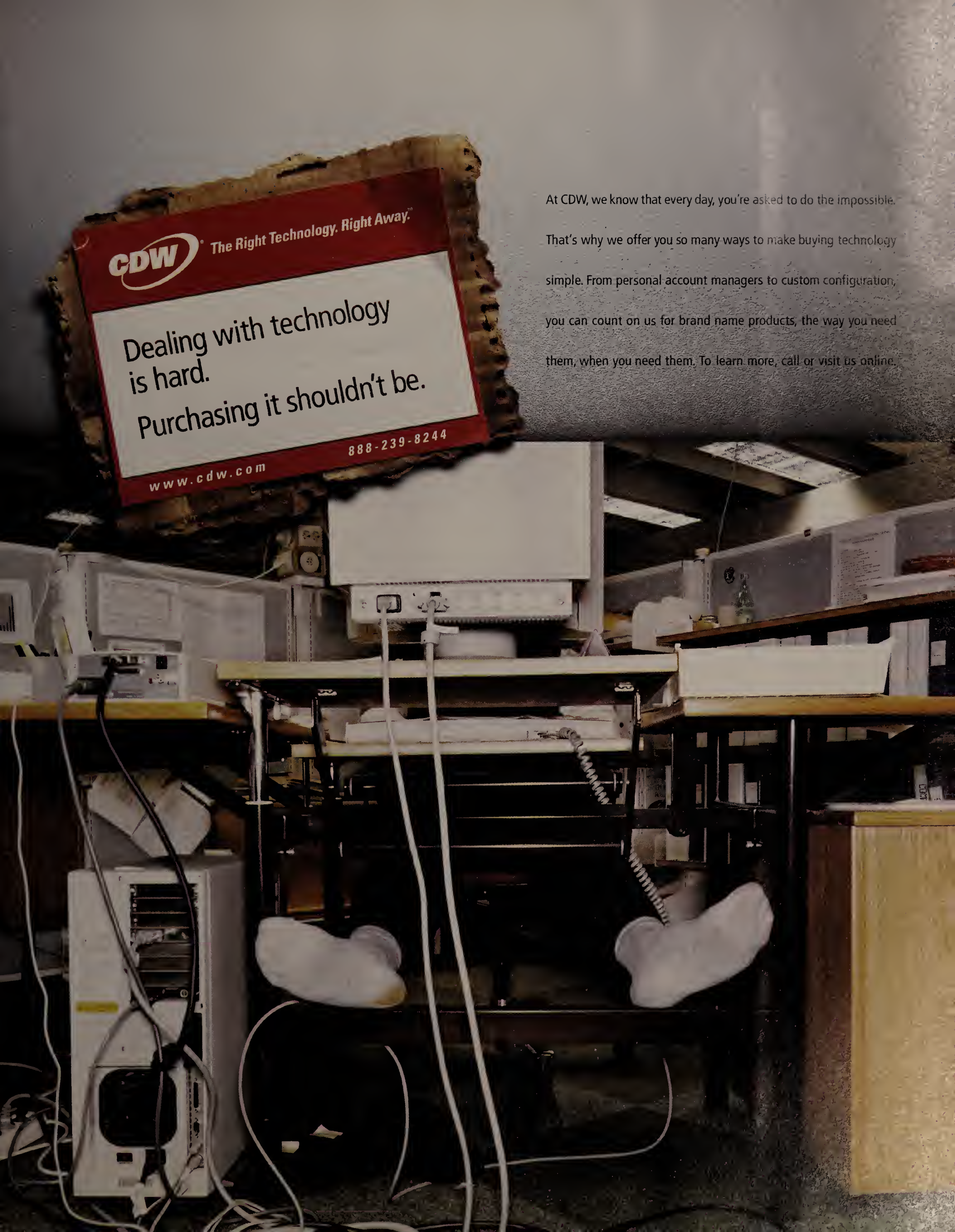
analyst with The Yankee Group.

"Users need to test their networks because the mileage and application performance they are going to get are going to vary with iSCSI and Fibre Channel over IP," Gruener says. "Until we know more, customers should take the additional research and understand what they are getting before they go out and deploy a full network and spend a lot of money on something that won't give them the necessary performance."

The PacketSphere starts at $24,500 and is available now; the GTX Jammer for iSCSI starts at $40,000 and requires a hardware-based protocol analyzer. It will be available next month.

Empirix: www.empirix.com; Finisar: www.finisar.com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Special Focus

ENTERPRISE NETWORKS: A look at virtual LANs.

Users get innovative with virtual LANs

■ BY PHIL HOCHMUTH

While virtual LANs might not be the sexiest network technology, the old standby method for logically segmenting network nodes is being used as electronic duct tape of sorts for many enterprise users.

VLANs are deployed in corporate networks in a variety of ways, including network security authentication, a way to let wireless clients roam among 802.11b access points, a method of segregating IP voice traffic and a way to contain legacy traffic on networks with heterogeneous protocols.

Introduced almost six years ago, most VLANs are based on the IEEE 802.1Q and 802.1p standards. The 802.1Q specification establishes a standard method for inserting VLAN membership information into Ethernet frames. 802.1p is a specification for giving Layer 2 switches the ability to prioritize traffic and perform dynamic multicast filtering.

When first introduced, VLANs were touted as a way to simplify address management by letting IT shops physically deploy servers and PCs anywhere on a network and then associate the machines into groups virtually.

Software on most managed network equipment can be used to associate PC media access control (MAC) addresses with VLANs, letting the client automatically connect to its network when moved from one port to another.

As Layer 3 switches emerged, observers said VLAN technology would become obsolete, as wire-speed routing between subnets would let users control network broadcast traffic more easily. Also, widespread use of Dynamic Host Configuration Protocol (DHCP) on IP networks solved the issue of user mobility. DHCP automatically assigns IP addresses to workstations as needed.

> **“If we didn't segregate the wireless traffic into its own VLAN, it would be a nightmare with people moving around campus who want to stay connected.”**
>
> **Pat Cronin**
> Bridgewater State College, telecommunications director

Still, with Layer 3 switches accounting for only 6% of the worldwide Ethernet switch port installed base, according to IDC, VLAN usage still is active among network professionals. Users also are turning on 802.1Q technology in their networks for reasons other than just network management.

Order in the VLAN court

Harris County, Texas, which includes Houston and its suburbs, recently combined four buildings and 122 courtrooms, court offices and Justice Department offices into a single, 22-story high-rise facility. The building was a natural opportunity for one VLAN, says Jerrl Evans, managing director of infrastructure and network services for Harris County, because combining the 122 private subnetworks in one VLAN was easier than physically plugging users into groups of ports.

VLAN pros and cons

Virtual LAN technology is a good tool for organizing and controlling traffic on a network, network professionals say. But there are pluses and minuses to the technology.

Pros:	Cons:
• Allows for dynamic reorganizatoin of LAN groups. • Can be used to segment “chatty” protocols or to isolate certain traffic like voice over IP. • Could enable wireless LAN clients to roam without dropping a connection.	• VLANs spread over too many switches could saturate backbone trunks. • Could add complexity to subnet configurations. • Occasional leakage of data between VLANs can occur.

VLANs and static IP addresses also are used as a security mechanism, Evans says. All clients working in the new building are given static IP addresses and connect to the network via Alcatel OmniSwitch routers and OmniCore 5052 backbone switches deployed throughout the building. The VLAN is configured throughout the building, which lets them connect to the network by plugging into any port.

This configuration lets judges and attorneys who might work in different courtrooms throughout the week plug into any port and be on their home networks, Evans says. The setup also provides security by controlling authorized users' access rights, and restricting nonregistered users from any access at all.

“The only way anyone can plug into the network at all is for them to have an IP address on their machine that's on one of our VLANs,” Evans says.

Roaming through college

Managing a roaming client base gets even trickier when Wi-Fi is thrown into the mix, as was done recently at Bridgewater State College in Massachusetts.

The school has deployed more than 100 Enterasys Networks RoamAbout 802.11b/a wireless access points that students can use to access the Web and e-mail throughout the campus.

“If we didn't segregate the wireless traffic into its own VLAN, it would be a nightmare with people moving around campus who want to stay connected,” says Pat Cronin, telecommunications director at Bridgewater State.

“Putting all wireless traffic on a VLAN ensures that no one drops off the network as they move from access point to access point,” which is quite common, as the Enterasys access points deployed throughout the campus have a range of only 150 feet, he says.

Cronin uses a mix of Cisco and Enterasys stackable switches in the dorms, classrooms and administration offices to connect the wireless access points.

After getting over a few cross-vendor VLAN configuration issues, students and faculty now can roam anywhere and stay connected on the same VLAN, whether they are connected to a Cisco or Enterasys switch, he says.

Using VLAN to manage legacy protocols

While some IT professionals find VLANs useful for securing and managing network clients, James Labonte, network engineer at St. John's Hospital in Springfield, Ill., finds VLANs a useful tool for taming the mix of chatty and hard-to-manage legacy protocols running on his network.

“A lot of what we do with VLANs involves creating private networks,” Labonte says. “Some vendors will say they want you to buy separate network hardware in order to keep networks segmented ... but we found that we could save a lot of time and money by creating the private networks virtually.”

Labonte uses SmartSwitch stackable switches and SmartSwitch Router backbone switches from Enterasys to maintain VLANs throughout the hospital's subnetworks, which run a variety of protocols.

“We keep all our bridged protocols on their own VLAN,” Labonte says. “Why have a machine sending broadcast messages to devices that will just ignore it anyway?”

St. John's uses Digital VAX minicomputers for customized medical database applications that run on the legacy DECnet protocol. “DECnet does use quite a bit of broadcast traffic,” Labonte says. “We put that traffic on its own VLAN so the DECnet can only get to certain segments of the network.”

The same goes for the group of Novell NetWare 4.11 servers running on the network.

“We create separate IPX VLANs just for our Novell servers and users,” Labonte says. This keeps the majority of the network, which is based on IP and Windows NT/2000 servers, from getting bogged down with IPX and DECnet traffic, he says.

Segmenting voice-over-IP traffic into VLANs also has become a standard recommendation among IP telephony vendors such as 3Com, Cisco, Alcatel, Nortel and Avaya. All these vendors support 802.1Q technology on their switches and IP PBX devices, letting IP voice traffic be segmented onto its own VLAN.

Keeping voice on its own virtual segment can be useful, vendors and users say, as a way to isolate voice traffic for troubleshooting purposes. It also can ensure that voice quality does not degrade in the event of broadcast storms or large file downloads across larger segments of a network. ■

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STORAGE BUZZ

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STORAGE BUZZ

TECHNOLOGIES AND TRENDS CHANGING THE SHAPE OF STORAGE NETWORKS.

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IT executives have envisioned mixed network-attached storage and storage-area network architectures, and now vendors are building the bridges.

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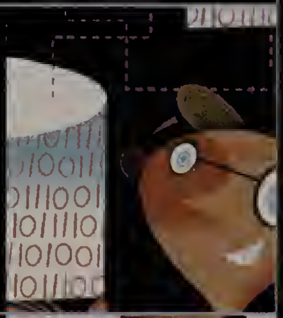
From remote copy to synchronous mirroring, these techniques bring resiliency to storage systems.



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Petroleum giant Valero Energy drills for better data back-up and restore operations.

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IP storage here we come, thanks in large part to the widespread adoption of the iSCSI specification for carrying SCSI traffic over IP networks.

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The birth of a standard to apply IPSec to IP storage is imminent, but added costs, performance impact and vendor noncompliance could hinder mass adoption.

The storage buzz

Storage has historically gotten a bad rap as an unglamorous technology. But today's rapidly changing storage market is generating a distinct buzz.

Exciting young technologies, such IP storage and NAS/SAN convergence gateways, are changing the way network executives think about storage. Start-ups with innovative product concepts are shaking up the market's establishment. Take Maranti Networks, one of our 10 start-ups to watch for 2002. It promises a storage switch that will be capable of distinguishing between high- and low-priority applications and tailoring service accordingly.

Even Cisco wants in. Its storage router, storage switch and investments in storage start-ups are only the beginning, it says.

Sept. 11, too, upped the storage buzz. The events of that day became an impetus for Corporate America to update and invest in better, more efficient back-up and recovery technologies.

Storage has stolen the limelight.

— Beth Schultz
Editor, Signature Series
bschultz@nww.com

COVER ILLUSTRATION BY JON WATSON

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THE NAS/SAN CONVERGENCE

IT executives have envisioned mixed network-attached storage and storage-area network architectures, and now are building the bridges.

GARY LAUFMAN

NAS/SAN convergence netted Autodesk the NAS back-up speeds it longed for, says Roberto Sigona, IT director.

BY DENI CONNOR

Roberto Sigona, IT director at Autodesk in San Rafael, Calif., was peeved about how long it took to back up files on his Windows 2000 network. He had several 500G-byte drives containing file-level data. "It was difficult to seamlessly replicate or back up the NT file system to a different location — physically, it would cause us weeks of downtime," he says.

What Sigona wanted was the ability to back up the Windows network-attached storage (NAS) servers with the same efficiency and reliability as backing up his storage-area network (SAN).

Not long ago, Sigona's wish would have gone unfulfilled. NAS was NAS and SAN was SAN, and that was that.

But using EMC's Celerra NAS/SAN gateway and Celerra HighRoad software, Sigona got what he wanted. With the gateway attached to Autodesk's Symmetrix arrays, the HighRoad software transports the files over IP but backs up the file-level NAS data across the high-speed SAN. "I get the best of both worlds," he says.

In fact, Sigona says, NAS data backs up 50 to 60 times faster now that it's going over the SAN.

And management is much easier, too. "The rest of our storage is centralized on our SAN, so we can use one console to manage NAS, SAN, direct-attached [storage], as well as the backup and replication of data," he says.

Sigona is not alone among enterprise users who want to converge NAS and SAN environments. Many are clamoring for products that let them use the same applications to manage their NAS appliances, SANs and direct-attached storage, and forgo decisions on how to manage block-level SAN, file-level NAS and DAS data.

And EMC is not alone among vendors responding to these product demands. A host of traditional storage vendors and start-ups are offering or developing products that blend Fibre Channel SANs with NAS and DAS arrays. These products take two shapes — as NAS/SAN gateways that let administrators attach SAN and DAS arrays to a NAS server, or as special-built hybrid boxes that attach existing storage devices for transport across IP networks.

A NAS/SAN party

Analysts expect nearly every storage vendor to offer convergence products.

"We are going to see storage vendors overall offering a combined approach that unifies NAS qualities of being able to understand files and the ability to handle block [transfers of data]," says Jamie Gruener, an analyst with The Yankee Group. "That will happen in the next six to 12 months."

Already, EMC, IBM, Hitachi Data Systems, LSI Logic and MTI have retrofit Fibre Channel arrays and NAS appliances into NAS/SAN gateways. NAS vendors Network Appliance and Xiotech, a Seagate company, promise NAS appliances that will handle block-level data. And start-ups 3ParData, Cereva Networks, Yotta Yotta and Zambeel are making purpose-built NAS/SAN convergence boxes that show promise, says Steve Duplessie, an analyst with Enterprise Storage Group. The start-ups haven't disclosed product details, but all say their wares will replace or connect to existing SAN, NAS or DAS devices (see graphic).

With these NAS/SAN devices, SAN-based arrays or DAS servers attach to a diskless NAS head. Software residing on the NAS head then distributes SAN or NAS data over the appropriate network, depending on the size of the data and the best path.

At Autodesk, the EMC Celerra HighRoad software examines requests for data from Windows NT clients and returns the data over the SAN or IP network, whichever it determines would be faster. If the data consists of small files, HighRoad will return it over IP; if the data is characteristic of online transaction processing or other block type, the software will route it over the SAN.

NAS vendor Auspex Systems and IBM are adopting what Gruener says is perhaps the nirvana of storage. They have promised to attach any vendor's storage array to their NAS/SAN gateways. They'll accomplish this through testing, certifying that different storage arrays work with their NAS servers.

Such interoperability won't be widespread, Gruener says. Rather, Fibre Channel arrays likely will be accessed by a NAS-like file system. "You will see a new architecture that will be a storage array that has a file system as well as a RAID controller," he says.

Analysts point to two start-ups developing such products. Broadband Storage, still in stealth mode, is expected to place a distributed file system and virtualized management interface over clusters of NAS appliances and SAN arrays, Duplessie says.

LeftHand Networks, and its Network Unified Storage product, lets IT managers decide between file- and block-level data over IP. A future module will handle the data types concurrently.

NAS/SAN convergence "takes application awareness to a whole new level because you are now able to select a storage environment that will turn on for some applications and turn off for others, depending on what you are doing," Gruener says.

For Autodesk's Sigona, the ability to use the same storage applications for file- and block-level data made sense. "We wanted to centralize the storage for all our applications whether they were [SAN] or NT-based," he says.

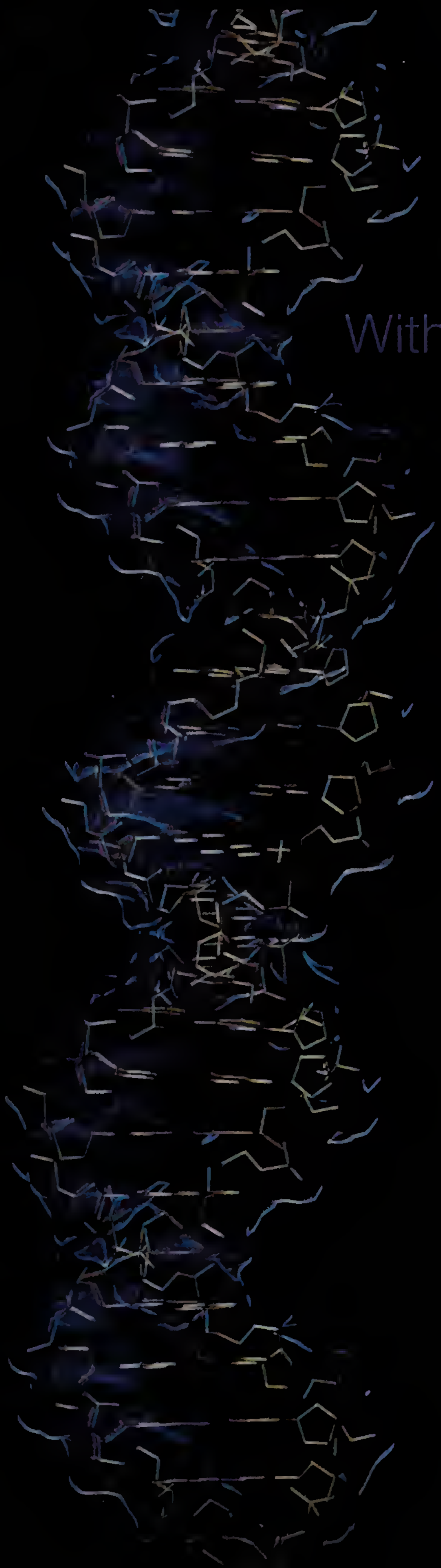
Rich Brenton, senior technical architect for electric wholesaler PJM in Norristown, Pa., also sees the benefits. He centralized storage administration by consolidating about 18 file-level DAS servers onto an IBM Shark SAN array and placing an IBM TotalStorage NAS 300G between the company's IP network and the Shark. The NAS 300G routes file-level data over the IP network, and routes block-level data through the SAN fabric. He can now

See NAS/SAN, page 8

THE CONVERGENCE COLLECTION

The following vendors are offering or planning NAS/SAN convergence devices.

Vendor	Product	Type of convergence device	Function
Auspex Systems	NSc3000	NAS/SAN gateway	Attaches any Fibre Channel array
EMC	Celerra SE and HighRoad software	NAS/SAN gateway and software	Attaches Fibre Channel to NAS
Hitachi Data Systems	Hitachi Freedom NAS	NAS/SAN gateway	Attaches Fibre Channel to NAS
IBM	TotalStorage NAS 300G	NAS/SAN gateway	Attaches Fibre Channel to NAS
LeftHand Networks	Network Unified Storage	NAS/SAN gateway	Connects NAS and SAN
LSI Logic	ConverSANt	NAS/SAN gateway and software	Attaches Fibre Channel to NAS
Network Appliance	Unknown	NAS/SAN gateway	Attaches Fibre Channel to NAS
Xiotech	Magnitude	NAS/SAN gateway	Attaches Fibre Channel to NAS
3ParData	"Scaffold" utility storage	Hybrid	Replaces DAS, NAS, SAN
Broadband Storage	Unknown	Hybrid	Provides file-level access to NAS/SAN data
Cereva Networks	Cereva 5000	Hybrid	Replaces DAS, NAS, SAN
Yotta Yotta	NetStorager	Hybrid	Connects DAS, NAS, SAN
Zambeel	z-Series	Hybrid	Connects DAS, NAS, SAN



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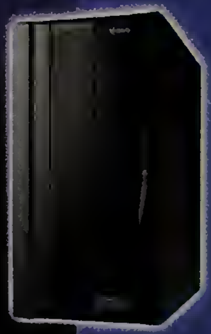

NAS/SAN, continued from page 6

back up his system data from the same spot. "As our data center grew, [maintaining] the [DAS] became a nightmare — [my] support guys were running around swapping RAID drives all the time," he says.

NAS/SAN trouble spots

As advantageous as NAS/SAN convergence can be, it has drawbacks. EMC, Hitachi and LSI Logic NAS/SAN gateways only let arrays from the same vendor be joined to the NAS head, for example. And while vendors have consolidated some applications and management under one interface, they haven't gone far enough, some sources say. IT managers still can't share data on the SAN between devices or look at file-level data on the SAN without going through the server, IBM representatives say. Although they want to use one software product for files and another for blocks, they have to use NAS applications for some and SAN for others.

What's more, moving storage out of the isolated data center and across IP networks puts it at risk of intrusions that before were not possible. Many industry watchers advocate the use of IP Security (IPSec) and Secure Sockets Layer to secure transport of storage data over the IP network (see related story, page 20). And Cisco, EMC and several other vendors have recently proposed the FCsec specification, a Fibre Channel variant of IPSec, to the Internet Engineering Task Force.

"Some vendors are looking at ways to safeguard their storage networks by better architecture. Others are looking at ways to enforce security in a policy-based approach by reinforcing around the edge of the network," Gruener says. "The security issues of combining block- and file-level data are challenging because you still need to uniformly enforce security policies against block and file formats."

While technologies such as logical unit number masking and zoning — methods that partition the data and control access in SANs — work for block-level data, another approach is needed for file-level data, whose access is enforced by the operating system, Gruener says.

The cost of NAS/SAN gateways also varies widely, depending on the amount of storage attached to the NAS head and the cost of the NAS head itself. In many cases, enterprise users already will have the storage they want to consolidate — they will only need to buy the NAS head and software necessary to make it work.

For PJM, making NAS/SAN convergence possible meant buying into the $30,000 starting price for IBM TotalStorage NAS 300G, Brenton says. "That's pretty much the reason we went to the 300G," he says. "We wanted to leverage our existing storage." ■

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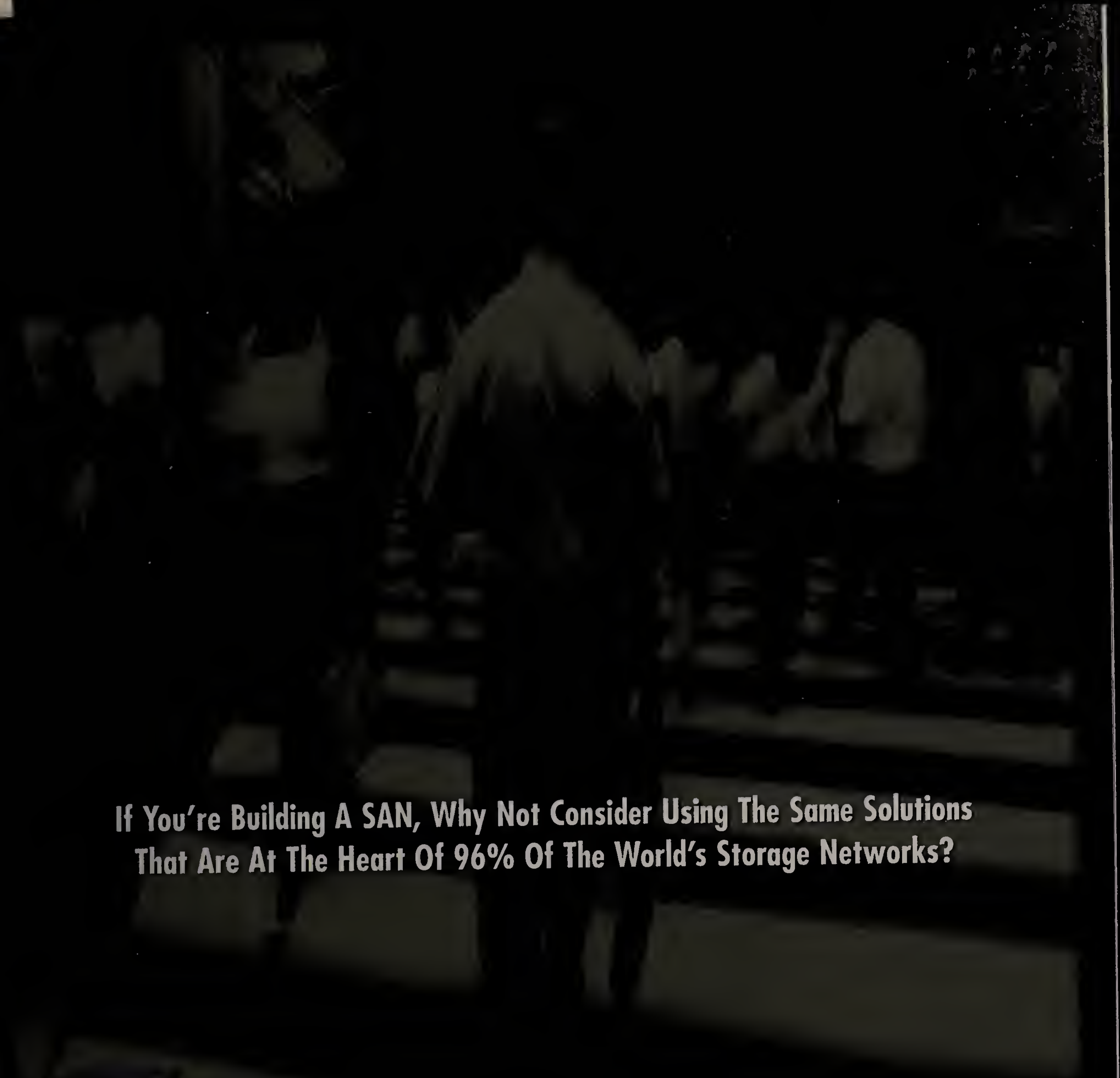
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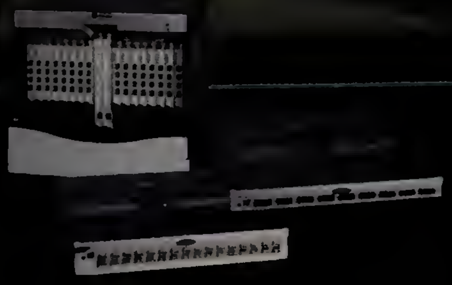

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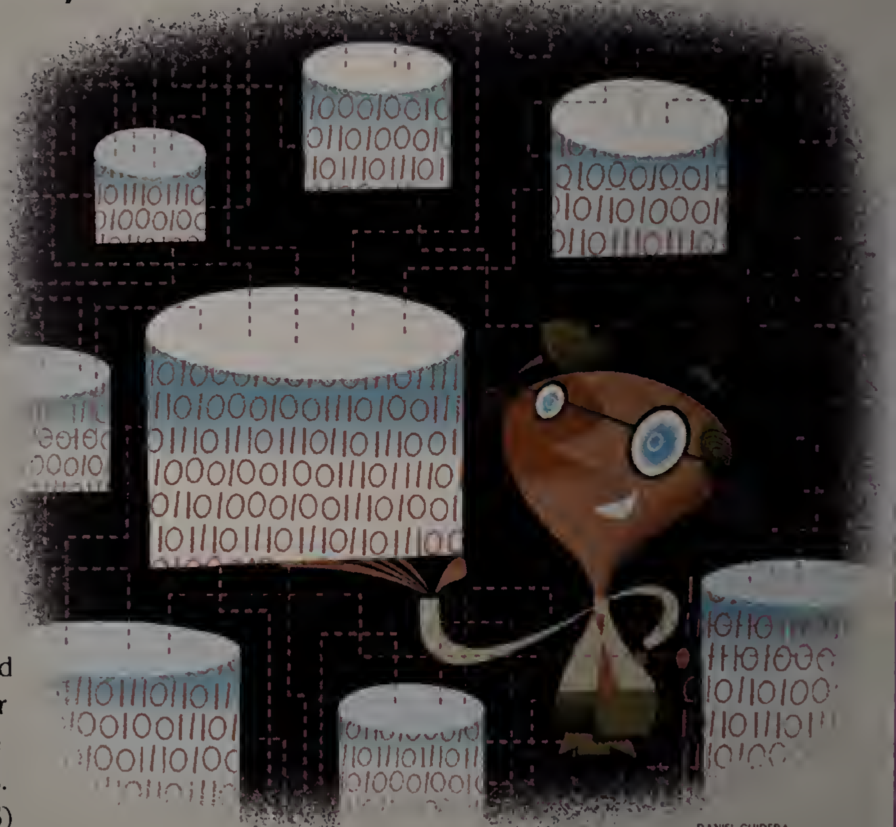
DISASTER-PROOFING STORAGE SYSTEMS

From remote copy to synchronous mirroring, these techniques bring resiliency to storage systems.

■ BY PAUL DESMOND


DANIEL GUIDERA

When it comes to data storage, redundancy is never superfluous.

With the right amount of redundancy, you can make sure access to critical data is never denied. What you need is a tiered strategy comprising multiple network paths to storage systems and copies of data locally and off-site.

Making storage always available starts locally because human errors, not disasters, cause 90% of outages, says Steve Duplessie, senior analyst with Enterprise Storage Group. The first step toward eliminating local problems is clustering servers so a single server outage won't cut off all data access. Similarly, connecting storage devices to a redundant network will provide multiple data paths. That can be accomplished using network-attached storage (NAS) devices or a storage-area network (SAN).

You also want to store the local data in more than one place, which means replicating data on multiple storage servers, disk arrays, NAS appliances or storage subsystems on a SAN.

Replication routines

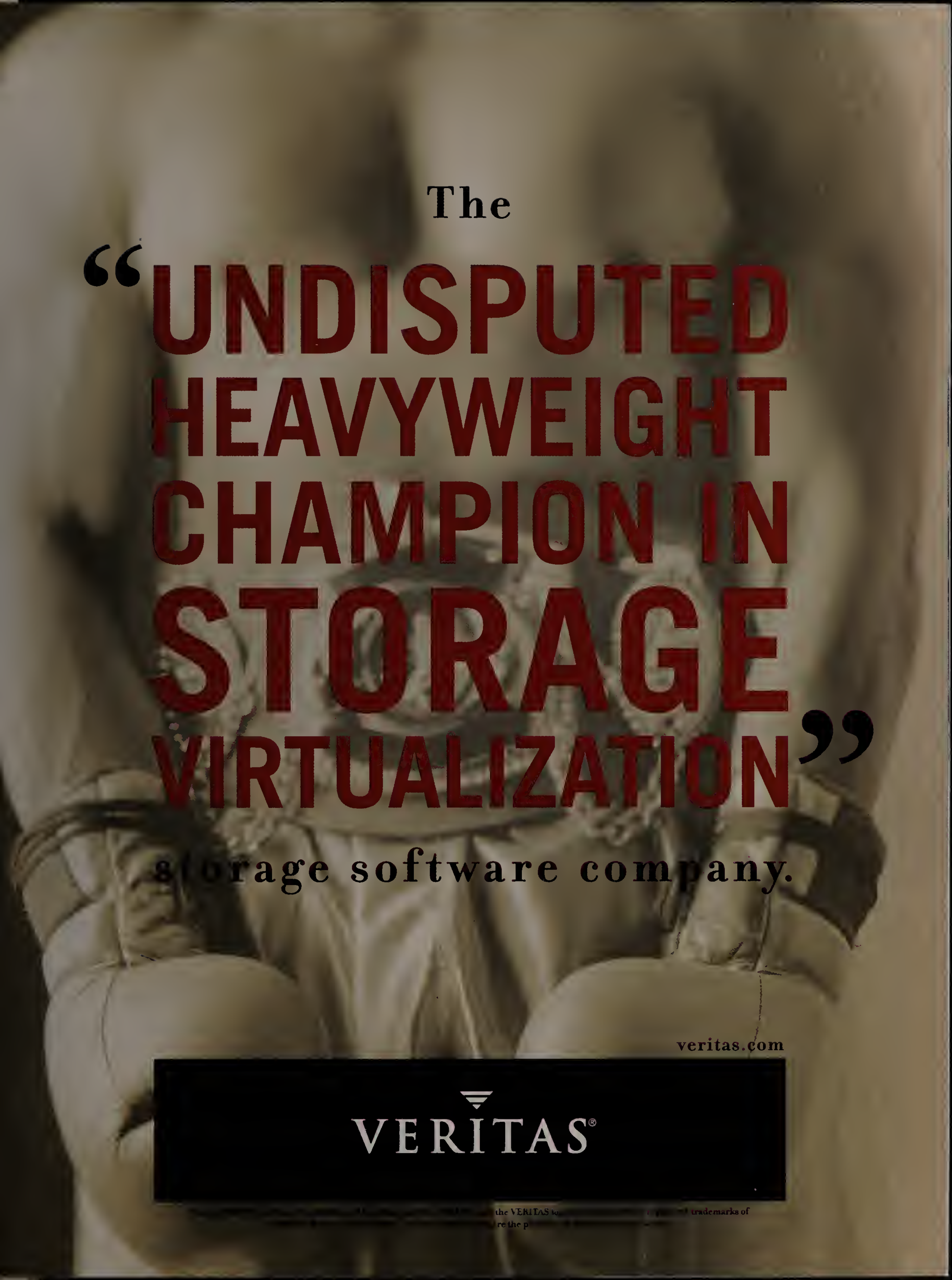
The purest form of replication is synchronous mirroring, in which you write the same data to two disks, says Jon Toigo, independent consultant and author of the book *Disaster Recovery Planning*. Synchronous means the write operation has to complete on both copies before the application driving the transaction will move to the next step. If either copy hangs, the transaction won't complete. Because it has a low tolerance for latency, synchronous mirroring typically is performed only locally.

If your environment requires something less than pure synchronous mirroring, you have plenty of choices. Vendors such as Quantum and Network Appliance have mirroring software for their NAS devices, where only changed data is sent back and forth to keep latency to a minimum. Other vendors, such as Ultera Systems, employ a SCSI controller to write data to primary and secondary drives. Some SAN switches employ a similar approach, writing the same data to multiple targets, Toigo says.

Protecting against wholesale disasters — what Toigo calls "smoke and rubble" scenarios — requires replicating data to a remote storage device. Here again, a number of tried-and-true techniques can apply. One is point-in-time copy, where snapshots of data on one storage system are replicated to another system at designated time intervals. The frequency of the snapshots depends on how much data you reasonably can afford to lose if the worst happens and how much storage capacity you are willing to dedicate to the snapshots. In some cases, a daily snapshot will suffice. In others, snapshots are needed every few minutes.

Another technique is remote copy, which amounts to writing data to local and remote storage devices at the same time. However, latency imposed by distance creates a lag between the time data is written locally and remotely. That time represents your window of vulnerability to having the two copies out of sync, Toigo says. If you're dealing with data that doesn't change often, such as

See Disaster, page 12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Disaster, continued from page 10

customer profile information, the lag is probably not an issue, but it can be for transactions that change by the second.

Most major storage hardware vendors have products that perform one or more forms of data replication, such as EMC's Symmetrix Remote Data Facility. In general, these products only work with the vendor's own storage gear.

This compatibility issue is one reason tape is still the storage workhorse, Toigo says. Tape is portable and flexible. It can be used to back up or restore to any system, he says.

But Duplessie says that flexible software-based data replication tools are emerging as alternatives to proprietary hardware approaches. These alternatives, such as NSI Software's Double-Take, allow data replication from any type of storage system to any other, over any type of IP network connection, he says.

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Putting it all together

Maharam Fabric, a wholesale textile distributor in Hauppauge, N.Y., chose software-based data replication as part of its disaster-proofing strategy. It is using SteelEye Technology's LifeKeeper software to replicate data from its main operations center to a satellite office, says Sal DeAugustino, network administration manager for the company.

As a result of the Sept. 11 terrorist attacks, Maharam Fabric's Park Avenue office in New York lost network connectivity and couldn't access data stored in Hauppauge. After that, the company decided to assess the effect of a full-fledged disaster striking the Hauppauge facility, DeAugustino says.

Addressing the issue meant examining how the company functions day to day and determining what data it simply can't live without — an 8G-byte enterprise resource planning (ERP) system used to track all aspects of Maharam Fabric's business, from the cutting and shipping of fabric to accounting and purchasing.

The company's new data protection plan includes keeping a copy of the ERP database on each of a pair of clustered Compaq ProLiant servers. Data is replicated between them using the LifeKeeper software, providing an exact copy of all data locally. Maharam Fabric also performs a point-in-time backup of its database, sending any changed data to an auxiliary server located in its New York City office every 30 minutes. The company figured it could re-create the six to 12 transactions — new or updated fabric orders — that might be lost during that window, DeAugustino says.

The SteelEye setup was far more cost-effective than systems from storage hardware providers, whose prices were out of reach, he says. The company paid about $75,000 for the two Compaq servers, a Linux operating system and SteelEye software.

Prices vary dramatically, depending on what you're trying to do. "There are various choices at every aspect, from cheap to ungodly expensive," Duplessie says.

In all, Maharam Fabric spends about 25% of its IT budget on storage, DeAugustino says, far less than the nearly 60% that Toigo says is the norm. But users don't have much choice.

"Data is an irreplaceable asset, so has to be protected," Toigo says. "The only way to do it is through redundancy." ■

Desmond is a writer and editor in Framingham, Mass. He can be reached at paul@pdedit.com.

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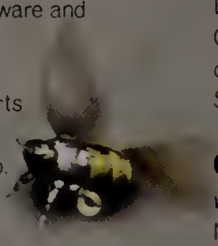
EMC
www.emc.com
Line of storage hardware and software includes Symmetrix Remote Data Facility/TimeFinder Manager replication tools.

FalconStor Software
www.falconstor.com
IPStor software supports replication and virtualization over IP and Fibre Channel nets.

Hewlett-Packard
www.hp.com/products1/storage
Line of storage hardware and software includes SureStore SANLink, software that supports mirroring and point-in- time backup.



IBM/Tivoli
www.tivoli.com/products/ solutions/ storage/news.html
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NSI Software
www.nsisoftware.com
Double-Take provides replication and GeoCluster improves availability and disaster recovery in Microsoft Cluster Server environments.

Quantum
www.quantum.com
NAS devices include optional Server-to-Server Synchronization software.

SteelEye Technology
www.steeleye.com
LifeKeeper replication software works over LANs and WANs.

StoreAge Networking Technologies
www.store-age.com
Products include the Storage Virtualization Manager appliance for creating virtual SANs, MultiView and MultiCopy replication tools.

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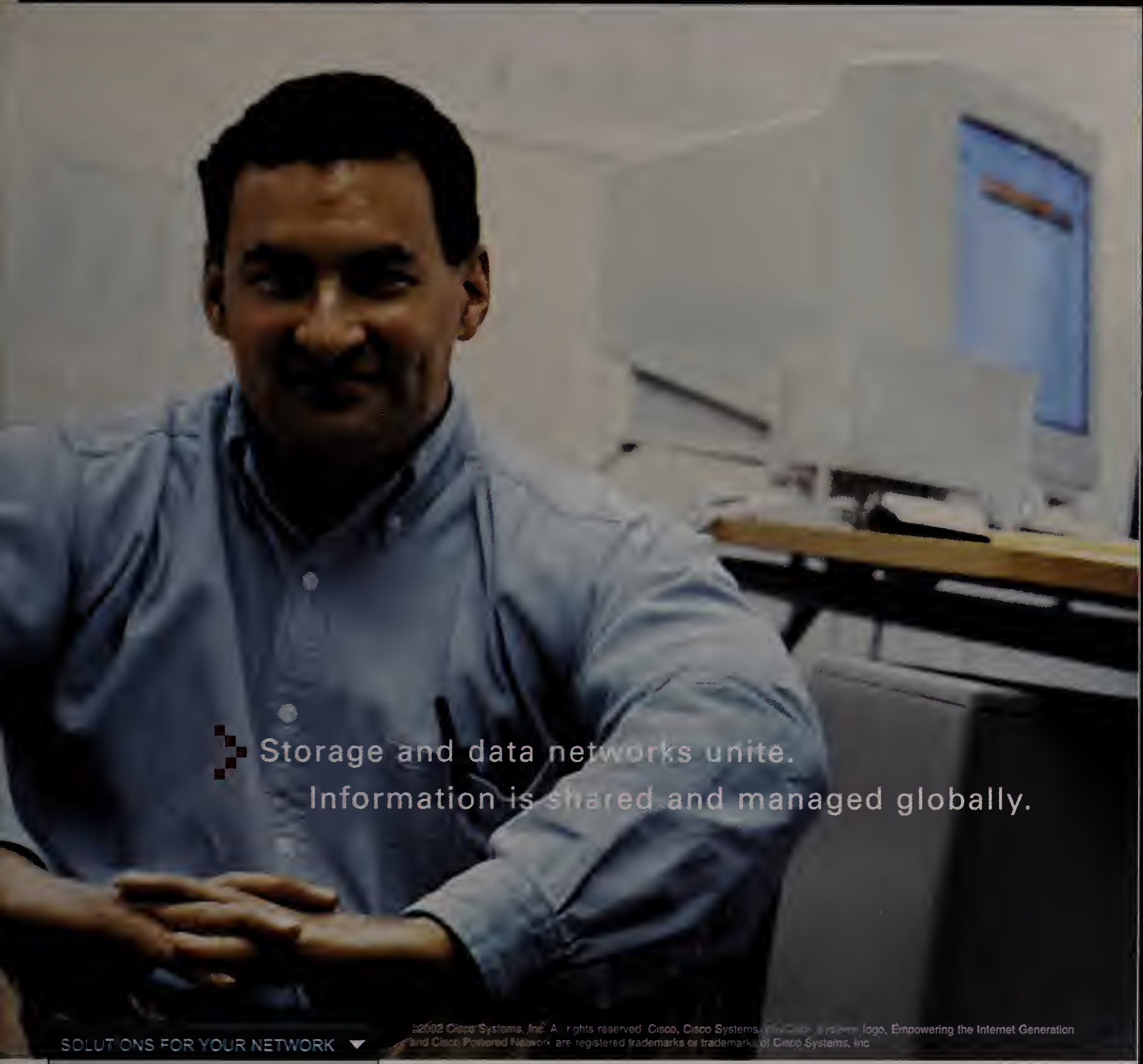

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REFINING STORAGE BACKUPS

Petroleum giant Valero Energy drills for better data back-up and restore operations.

■ BY BETH SCHULTZ

When petroleum giants Ultramar Diamond Shamrock and Valero Energy finalized their megamerger in December, the task of protecting two gargantuan data storage architectures became urgent.

Storage specialists at the merged company, the new Valero, knew they needed to craft a plan for a single, integrated back-up and restore system. The goal is to ensure data availability yet lower administrative costs.

Such integration will be no easy task. The data involved in operating the third-largest U.S. petroleum refining and marketing firm, a Fortune 50 company with annual revenue approaching $30 billion, is staggering.

The new Valero pumps 2 million barrels per day out of refineries and supplies gasoline to nearly 5,000 service stations nationwide. In so doing, it generates terabytes of data, which reside on hundreds of NetWare, Unix and Windows servers.

Integrating backup is the No. 1 storage management priority for the merged storage team, says James Brents, technical specialist at Valero in San Antonio, Texas. "Our goal is to be able to restore the data first and foremost. Secondly, we have to continue meeting our back-up window as our data grows," he says.

The new Valero backs up an average of 12 terabytes of data nightly across a LAN or storage-area network (SAN). This is storage from 35 AIX and 40 other Unix boxes (running HP-UX or Solaris), 32 NetWare servers and 350 Windows NT or 2000 servers. The largest databases, those in the 100-plus gigabyte range, are backed up over a SAN.

Integrating the previously disparate back-up efforts promises easier maintenance and reduced costs. "We will be able to focus our administrators, and they will be able

See Valero, page 16

Valero Energy's storage masters (from left) James Brents, Greg Jordan and Pablo Clifton are always searching for ways to refine the process of backing up the company's critical business data.

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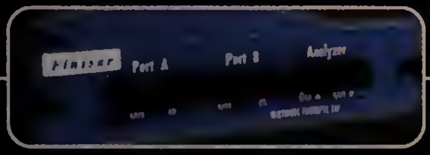

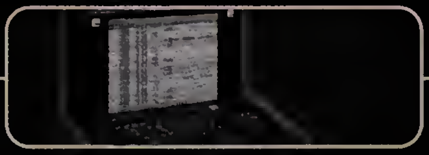

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Valero, continued from page 14

to share training and experiences," Brents says.

The new Valero currently uses IBM/Tivoli Storage Manager (TSM) and Hewlett-Packard's Storage Omniback for backups. TSM handles most backups at the Valero North campus and the NT backups at the Valero corporate offices, where the Omniback handles Unix backups.

"Part of our challenge is evaluating the technologies used by the two companies previously and determining whether it makes sense to integrate and how to do that, or whether it makes sense to standardize on one," says Mark Calkins, senior IT manager at the new Valero. "We are looking for synergies."

Brents won't disclose the cost of the back-up integration project. But he stresses the need for sound data retention policies for backups and archives when it comes to managing storage volumes as large as the new Valero's. His advice is to include back-up, archive and disaster-recovery costs into initial storage plans. In so doing, he says, "don't believe the users when they say they'll only need X amount of space. They always need two times, three times and more."

The storage team says the integration project should be complete in September.

Speed freaks

To meet its second goal of speeding back-up time, the team is investigating LAN-free backups, in which Valero's TSM clients back up data directly to tape drives on the company's SAN. Control information, such as storage policies and metadata, would continue flowing over the LAN to the TSM server.

Transferring data over the SAN rather than the LAN "will help avoid network bottlenecks and take a load off the LAN]," says Pablo Clifton, technical specialist at the new Valero. Today, the new Valero backs up its 1-terabyte SAP ERP database at a speed of 400G bytes per hour. In a recent test, Valero backed up that database in two-and-a-half hours. While the storage team isn't unhappy with that rate, it believes it can improve that time by at least 200G bytes per hour with LAN-free mode, Clifton says.

While Valero seeks out new back-up technologies, it also presses to achieve backups at the published speed of its tape back-up devices. Brents is particularly proud of that practice. "Reducing the back-up window is always the goal, but [you have to] keep in mind that a tape library also needs time to perform the daily administration processes, such as reclamation, off-site copies, expiration and the TSM database backup," he says. "The more time available for those processes to complete daily, the quicker the restores."

Valero tests its back-up and restore procedures often. It conducts major back-up tests four times per year, with project tests multiple times per month and hot data backups six times per week, Brents says.

Testing is a challenge, but absolutely necessary, he adds. "It's really tough to have a duplicate test environment when you have such a large operation."

Remember, Brents says, "you must manage your data, and not let your data manage you." ■

VARIETY AT VALERO

By using NAS and SAN, the company avoids reliance on a single vendor.

While the new Valero considers whether to standardize on a back-up solution, its overall storage environment will remain as diversified as ever.

The company uses network-attached storage (NAS) devices and storage-area networks (SAN), and so has a mixed bag of products. Those include:

- **McData's ED-6064 Fibre Channel Galaxy-Class Director as its SAN backbone at the Valero North campus.**
- **Brocade Communications' SilkWorm switch for the SAN at the Valero South corporate offices.**
- **IBM's Shark Enterprise Storage Server for disk storage.**
- **Compaq's StorageWorks for SAN.**
- **Network Appliance's NetApps for NAS.**

"We've learned that it's not necessary to stick to one vendor or be afraid to choose an alternate product if it better fits the requirement," says James Brents, technical specialist at Valero.

Likewise, Valero's storage team has designed the SAN to work with a heterogeneous network, Brents says. "We can accommodate a variety of servers, switches, operating systems, applications, security models, etc. Our chosen products have capacity to spare and clear upgrade road maps."

— Beth Schultz

IN VALERO'S PIPELINE

The storage team plans to tackle these projects next.

Disaster recovery
The new Valero's storage team is conducting a business-impact analysis that it will use to craft a comprehensive disaster-recovery plan for the merged company. The plan will specify back-up and restore procedures on an application-by-application basis. Valero might back up certain applications to the SAN, while it moves others to the LAN.

SAN management
The new Valero uses point products for storage management now, but would like to find an umbrella SAN manager for zone configuration, performance reporting and storage allocation. It has evaluated McData's SANavigator and StorTek's SANView software, and expects to make a decision by year end.

Storage reporting
The storage team would like to tie SAN management data into its Hewlett-Packard OpenView and SAS IT Service Vision management tools.

— Beth Schultz

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THE LATEST ON iSCSI

IP storage here we come, thanks in large part to the widespread adoption of the iSCSI specification for carrying SCSI traffic over IP networks.

MICHELLE BARBERA

BY ANNE SKAMAROCK

Storage-area networks aren't just for the biggest companies manned with Fibre Channel experts anymore. Availability of iSCSI products opens the SAN door to companies of all sizes.

IT departments that go the SAN route gain unprecedented efficiencies in managing their data and storage over the direct-attached model. On a SAN, users can access shared storage using block-level protocols. But until recently, SANs have mostly meant the use of Fibre Channel technology.

Enter the iSCSI protocol, a melding of two standard technologies that have been available for more than 20 years. ISCSI provides the rules by which software or devices receive SCSI commands and data and repackages them into TCP/IP commands and data for movement across an IP network. Cisco, IBM and start-up Nishan Systems rolled out iSCSI products early last year, making it possible to build native IP-based SANs and mixed Fibre Channel-to-IP SANs.

Enterprise benefits

In a native iSCSI SAN, the application host transmits iSCSI packets, or bundles of data, across an IP network to an iSCSI storage device. A native iSCSI SAN provides the high availability, increased application uptime, ability to expand storage capacity without disruption, efficient storage utilization and higher capacity-to-staff ratios commonly associated with Fibre Channel SAN deployments, but for significantly less money.

An iSCSI SAN is less expensive to deploy than one based on Fibre Channel for two reasons. The first is that minimal additional hardware is required for an iSCSI SAN. IT departments won't need to buy new host bus adapters, network interface cards, or a separate IP network for storage (although it is highly recommended for performance reasons, as an optical network). However. if Fibre Channel storage or SCSI devices will be used on the iSCSI SAN, a router or bridge for translating iSCSI packets into their respective Fibre Channel or SCSI packets will be needed.

The second reason is that IT workers skilled in IP networks are abundant and generally less expensive to hire than people who know Fibre Channel. Provisioning a native iSCSI SAN means installing an iSCSI device driver (which vendors provide at no charge), attaching an iSCSI disk to the network, configuring the disk and mounting the disk partitions as if they were local drives — straightforward tasks for today's network and systems administrators.

The iSCSI entry point

Small to midsize businesses and departments are embracing native iSCSI storage products. For example, E-office, a consulting firm in Huis ter Heide, Netherlands, moved from a network-attached storage (NAS) infrastructure to a native iSCSI SAN primarily because it wanted all internal servers and storage managed consistently, but its Microsoft Exchange server wouldn't work in the NAS environment. Today, E-office performs all development and solutions testing, as well as e-mail, using the iSCSI SAN. The firm now clusters its Exchange servers, which it couldn't do easily before, says Jorn Bijnsdorp, infrastructure consult-

See iSCSI, page 22

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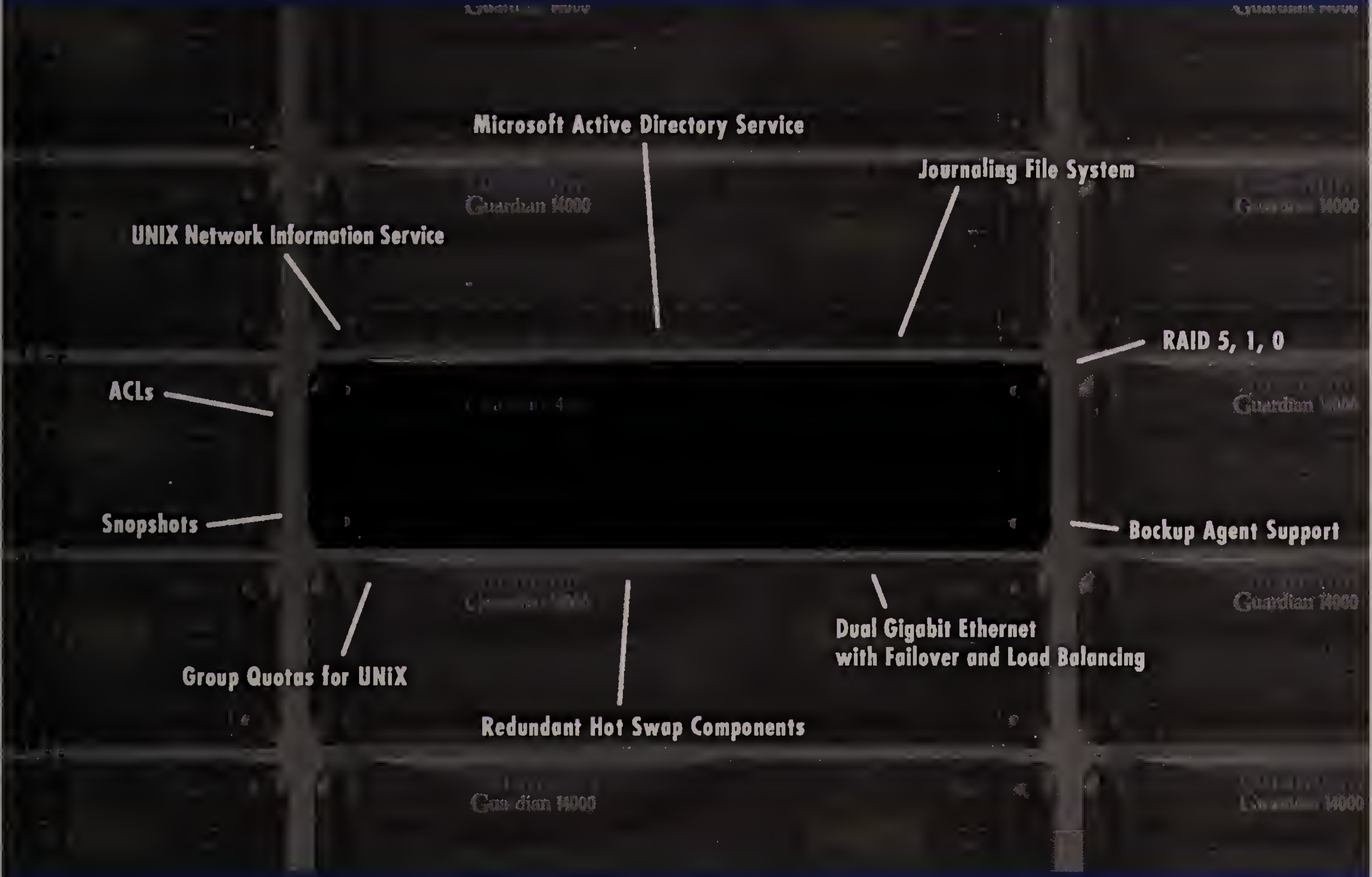

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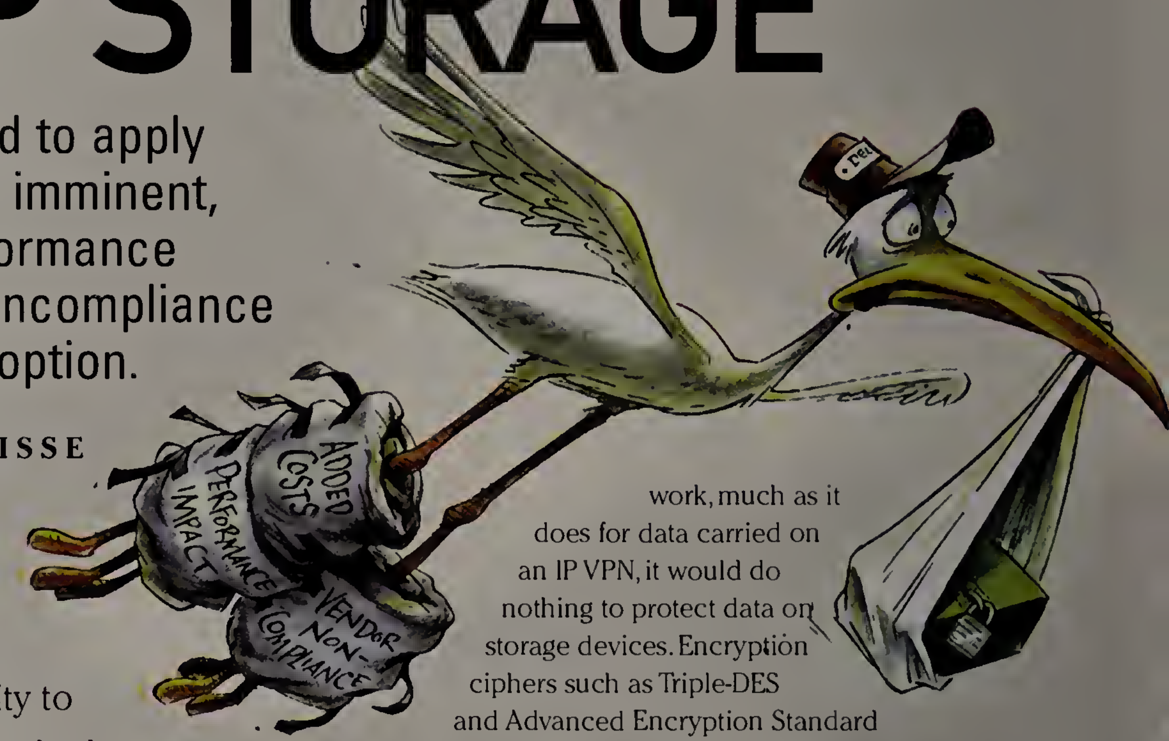
IPSEC FOR IP STORAGE

The birth of a standard to apply IPSec to IP storage is imminent, but added costs, performance impact and vendor noncompliance could hinder mass adoption.

■ BY KIMBERLY B. CAISSE



DAN VASCONCELLOS

If putting storage-area networks on IP is logical, which most agree it is, then it only makes sense to use IP Security to protect those SANs, or so says the Internet Engineering Task Force, to the ire of some storage vendors and the consternation of some users.

The IETF's Internet Engineering Steering Group (IESG) is mandating IPSec be used in three IP storage protocols: iSCSI, Fibre Channel over IP and Internet Fibre Channel Protocol. "The vulnerability is one of eavesdropping, and that's why the IESG insisted on the ability to encrypt," says Scott Bradner, a transport area director of the IETF's IP Storage Working Group and a *Network World* columnist.

Vendors that support the IESG decision include Broadcom, IBM, Microsoft, Nishan Systems, Nortel and Rhapsody Networks. They have created a proposed standard for securing IP block storage protocols. The draft, submitted in February, outlines the requirements for using IPSec with each storage protocol.

But relying on IPSec to solve the IP storage security problem misses the point, says Phil Grasso, founder of Sotera Networks, a start-up developing an IP storage security appliance. While IPSec would secure storage data in transport across an IP network, much as it does for data carried on an IP VPN, it would do nothing to protect data on storage devices. Encryption ciphers such as Triple-DES and Advanced Encryption Standard (AES) are needed for that, he says.

Triple-DES is the best way to secure IP storage because it encrypts data in transit and on storage devices and subsystems, Grasso and executives at fellow storage start-up NeoScale Systems contend. Triple-DES also encrypts today's Fibre Channel data, and it works with IPSec, they note.

But some storage vendors may be resistant to building IPSec into their products when they have no guarantee that it will be used, says John Webster, founder of Data Mobility Group, a storage market research and analysis firm. Per the draft standard, enterprise storage managers get the option of disabling the security mechanism.

Given the contention surrounding IPSec for IP storage, users might end up having to trade interoperability — or at least standards-compliance — for security.

Users might also face higher prices. Vendors have said that IPSec could triple or quadruple the cost of an iSCSI network interface card or TCP off-load engine, Webster says.

Tripling the cost would kill the IP storage opportunity for many users, says a technical services director for a national pension fund in Alexandria, Va. "Implementing a SAN is an

See IPSec, page 22

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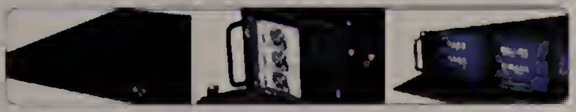

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IPSec, continued from page 20

expensive venture as it stands now," he says.

Vendors and users also fear that embedding IPSec in storage chips could significantly drop performance levels. "Some 1-GHz and 2-GHz processors finally have enough [million instructions per second] to keep up with software-based IPSec on 100M bit/sec media," says Jesse Walker, a network security architect at Intel and contributor to the proposed IETF IP storage security standard. "The emerging 1G bit/sec media overwhelm existing microprocessors, and higher-rate media will [also]."

But David Black, co-chair of the IETF IP Storage working group, points out that IPSec's impact will depend on the computational resources available in an IP storage network. The results depend on speed (100M vs. 1G), encryption algorithm (Triple-DES vs. AES), and the hardware platform (PowerPC vs. Pentium).

"There's no easy, simple answer," he says. ■

Caisse is a freelance writer in Massachusetts. She can be reached at kbcaisse@worldnet.att.net.

Vendor	Product	IPSec-enabled	Other security mechanism?	Function	Availability/Pricing
Alacritech	1000x1 Server and Storage Accelerator	Yes	No	Can be used as a NIC, iSCSI adapter or dual-function card.	General availability in April for $1000.
NeoScale Systems	"Stateful storage processing"	No, but will be compatible with it.	Triple-DES	Will encrypt data in transit and on storage media.	Fibre Channel product, CryptoStor FC, due out by year-end. IP product to follow. Price unavailable.
NetOctave	NSP4200 Security Processor	Yes	No	Will do IPSec processing for storage devices.	Scheduled to be available in the fourth quearter. Price unavailable.
Sotera Networks	Storage appliance	No, but will be compatible with it.	Triple-DES	Will encrypt data in transit and on storage media.	Shipping data and price unavailable.

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iSCSI, continued from page 18

ant at E-office.

"We are looking for flexibility in storage without the cost and complexity of a [Fibre Channel] SAN," Bijnsdorp says.

In its iSCSI SAN, E-office supports 24 IBM xSeries 330 servers, using software iSCSI drivers, with two 200i iSCSI storage subsystems configured with 500G-byte RAID5e disks. It created a separate LAN for storage, primarily for security reasons — Bijnsdorp says he was worried about someone snooping IP packets.

ISCSI for disaster recovery

Among the Fortune 500, an iSCSI configuration gaining popularity is the combination of Fibre Channel and iSCSI to provide remote data replication for disaster recovery. In this environment, users have built a Fibre Channel SAN infrastructure to access primary storage repositories. Alternatively, they require the broader capabilities found in many Fibre Channel disk subsystems but are restricted by Fibre Channel's 6.2-mile distance limit. Fibre Channel-to-iSCSI lets them span distances required for disaster recovery.

Komatsu America, a manufacturer of construction and mining equipment in Vernon Hills, Ill., went with a Fibre Channel-to-iSCSI setup to accommodate storage data and disaster recovery for its extranet, a chief tool for distributors, says Dave Mucha, Webmaster with Kumatsu. It wanted to accommodate the extranet's rapid growth while keeping an overwhelming amount of data on a secure and reliable external storage system, such as IBM's Shark Enterprise Storage Server, he says.

"Since the deployment of a SAN environment can be lengthy and expensive, we were looking for alternatives to handle the storage needs of our applications servers and eventually the back-end systems that support them. ISCSI was the most cost-effective solution, as well as the most flexible," Mucha says.

Komatsu uses Fast Ethernet and Gigabit Ethernet switches and a pair of Cisco SN 5420 IP storage routers connected to a Fibre Channel-attached Shark to provide flexible connectivity for the Web servers. Once the storage was accessible to the IP network, the company could then provide a disaster-recovery site because, as Mucha says, "It takes only minutes for a server to connect to the Cisco SN 5420 and access the information on our [Shark]."

No doubt, the Fibre Channel SAN market will continue to provide high-end services for the data center. But as more iSCSI products become available, from companies such as Adaptec, Alacritech, FalconStor and Hewlett-Packard, the benefits of iSCSI SANs will become attainable by small to midsize businesses and departments within large companies. ■

Skamarock is a senior analyst with Enterprise Management Associates in Boulder, Colo., and co-author of Network World's *"Storage in the Enterprise" newsletter. She can be reached at askamarock@enterprisemanagement.com.*

Your people are hounding you for more storage space. Your support staff has just been cut. And you've already shot your IT budget for the year. You're not alone. The need for storage solutions is skyracketing, and more and more businesses are feeling the heat.

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■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

SOHOs warm up to storage alternatives

\teonix Networks' NASAS-2040 offers roomy storage, fast data rates, at a good price.

BY MIKE AVERY

NetworkWorld Review

A network-attached storage server is a ood choice for small businesses or home orkers who need to store and share files ithout the hassle of managing a tradi- onal file server.

I recently tested the teonix NASAS-2040, a U, rack-mountable Li- ux-based NAS that olds up to four Inte- rated Drive Electronics DE) disk drives. If you need a lot of stor- ge, the server also supports IDE "big drive" andards, which means it can hold disks s large as 144 petabytes once they ecome available (one petabyte equals ore than 1 million gigabytes).

Unlike many NAS vendors, Ateonix is ore interested in selling a server than rives, so you can buy it configured with no isks, or loaded with up to four. The review nit included four 160G-byte hard disks, e equivalent of 480G bytes of RAID-5 stor- ge. Ateonix says that once larger IDE rives are available, the NASAS-2040 will be ble to be expanded to hold up to 512 etabytes. Best of all, the NASAS-2040 is ery cost-effective.

Getting started

The NASAS-2040 is controlled through a simple Web interface. So simple, Ateonix says, that setup takes only about 5 minutes. But it didn't work that way for me. ZoneAlarm, the personal firewall I use to protect my PC, blocks cookies. And because the NAS interface relies on cookies, I got a blank screen. Ateonix hadn't yet run into desktop firewall users, so it took me a while to figure out what was wrong. Once I turned off the firewall, however, the installation did in fact take 5 minutes. The NASAS-2040 also has a front-panel LCD that provides system status. The panel was essential in troubleshooting our firewall problems.

Once I got the unit up and running, I used it to migrate my NetWare 4.11 server to FreeBSD Unix. I needed some place to put the data because this was going to be an in-place migration. Because I'm already running FreeBSD as my router and firewall, the choice was easy. For a home-based shop like mine, I didn't need the added complexity of NetWare or Microsoft Windows 2000, and upgrades to the current Novell or Microsoft products would have required a hardware upgrade — something I'm not prepared to pay for. FreeBSD lets me run on my existing hardware, is free, and gives me a performance boost to boot.

Fast file transfer

The NASAS-2040 works with Microsoft's Windows 2000 Active Directory, Windows NT domains, Microsoft networking workgroups, Common Internet File System/ Server Message Block, Network File System and AppleShare. But it won't work with NetWare, so I had to use PCs that were running the NetWare client software to copy the data from the NetWare server to the NAS. The data-throughput speed of the device impressed me. In informal benchmark testing, I compared the speed of the NASAS-2040 with NetWare 4.11, FreeBSD 4.4 and Win 2000 servers. In the end, the NAS transferred data more than twice as fast on all the tests as any other server.

The copy back was even faster, as I used the FreeBSD server to handle the copy. When I was using the four PCs, the data had to cross the network twice, once from the source server to the PC, and then again from the PC to the target server. By letting the servers handle the copy themselves, the data only crossed the wire once, so the speed was even better. I was surprised that the NASAS-2040 with IDE drives and RAID overhead was quicker than my FreeBSD server with SCSI drives. If I was making a purchase decision today, and all I needed was file sharing, I'd install a NASAS-2040.

Expansion headaches

One of the key things I wanted to see was how hard it was to expand the NASAS-2040. All too often NAS servers make it hard to add drives to their RAID, requiring a system backup and restore. In contrast, some of the more costly NAS servers and most storage-area network (SAN) servers will let you expand the array on the fly.

To test expandability, first I installed the unit with only two of the four drives, and then I added the other two. The hardware doesn't support hot swaps or additions like SAN servers typically do, so I had to turn the server off to add the second pair of drives. They slid in easily and the server came back up quickly, but that wasn't the end of the matter. Some newer RAID controllers let you expand a RAID array dynamically. I never saw a way to do this with the NASAS-2040. Instead, I had to copy the data off the NASAS-2040, disable the RAID-1 array I'd set up, and then create a RAID-5 array. Enduring a performance penalty during an on-the-fly RAID expansion would have been preferable to this backup, downtime and a restore. For most users, the winning strategy here is to buy the device filled with the largest drives you can find to put off any upgrades as long as possible.

Data safety

Many NAS servers on the market are based on Microsoft's Server Appliance Kit (SAK), which lets companies create a NAS server based on Microsoft's NT platforms. While many network managers have reservations about using NT for secure or mission-critical applications, SAK offers some compelling features, such as the

See Ateonix, page 24

■ Net Results

Ateonix Networks NASAS-2040 NAS server

4.5
RATING

Company: Ateonix, (888) 433-6788, www.ateonix.com **Cost:** $2,000 plus drives, $3,500 with 640G bytes installed. **Pros:** Easy Web setup; very cost-effective; uses any standard IDE drives; good technical support and documentation. **Cons:** Doesn't support snapshot recovery, on-the-fly RAID expansion or NetWare.

What's the score?	NASAS-2040
Price 20%	5
Performance 20%	5
Compatibility 20%	4
Capacity 20%	5
Features 10%	3
Installation and documentation 10%	4
TOTAL SCORE	4.5

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

Short Takes

■ **MCK Communications** recently announced a telephony system for teleworkers, the RemoteConneX PBXgateway with RemoteConneX Phones. Users plug the interactive screen phone into an analog connection, follow instructions, and then use the phone as if they were sitting in the office. Incoming corporate calls are redirected to the phone; unanswered calls are routed back to corporate voice mail, giving users a single mailbox. Features include call hold, transfer, conference, four-digit internal dialing and access to corporate directories. The system is available now and costs from $580 to $700 per user, including phones. www.mck.com

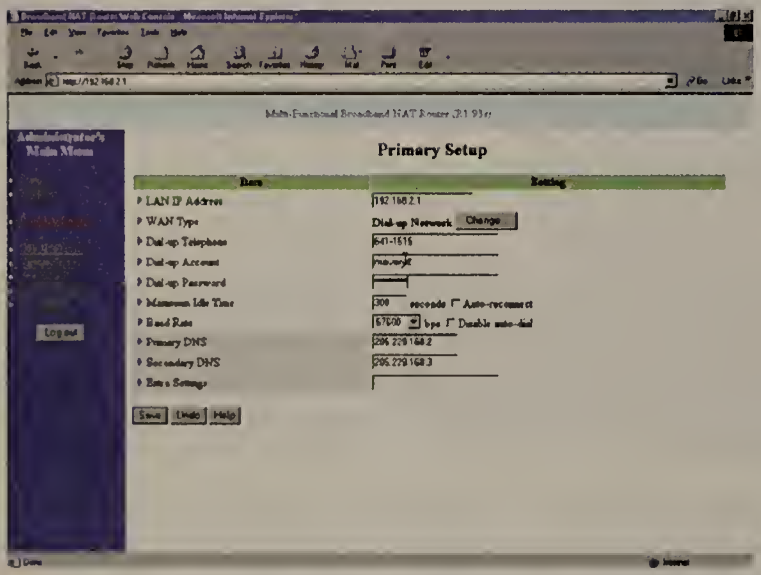
Low-cost gateway packs a punch

BY MIKE AVERY

NetworkWorld Review

Little-known GigaFast first grabbed our attention when we reviewed the company's five-port Ethernet switch — a standout performer and a great value (www.nwfusion.com, DocFinder:9528). Eager to see whether other GigaFast products are as good, we recently tested the EE400RP Internet Router.

While many companies call them Internet or security routers, a residential gateway is any device that connects the LAN to the WAN — in other words, connects a small office network to an Internet access service such as DSL, cable, or an ISDN/plain old telephone service serial connection. Basic gateways provide Dynamic Host Configuration Protocol (DHCP), network address translation and limited firewall functions. Some offer more advanced features such as additional LAN interfaces, 802.11b wireless and HomePNA (home phone line), as well as stronger security and VPN capability.


Primary Setup

Item	Setting
LAN IP Address	192.168.2.1
WAN Type	Dial-up Network [Change]
Dial-up Telephone	641-1515
Dial-up Account	[illegible]
Dial-up Password	
Maximum Idle Time	300 seconds ☐ Auto-reconnect
Baud Rate	57600 bps ☐ Disable auto-dial
Primary DNS	206.229.168.2
Secondary DNS	206.229.168.3
Extra Settings	

The primary setup screen handles the basic gateway configuration. The "WAN TYPE" button lets you change from dial-up to a broadband option.

In the end, we liked the GigaFast gateway as much as the top contenders in our recent roundup (www.nwfusion.com, Doc Finder: 9529), and it costs about a third less — only about $60.

Stress-free setup

As with the GigaFast five-port Ethernet switch, the four-port 10/100M bit/sec Ethernet gateway was housed in a rugged steel case. To keep heat and size under control, GigaFast uses a "brick on a leash style" power supply, a design that takes up two (or three) jacks on a power strip, surge suppressor or universal power supply. We'd prefer they put the transformer in the middle of the cord, so it only needs one.

Installation was about as simple as installing an Ethernet switch: Cable the WAN connection into your DSL or cable modem — or a hotel or apartment building Ethernet connection — and plug the rest of your network into the Ethernet switch ports. If you don't have a high-speed connection, you can plug an external serial ISDN device or modem into the gateway's serial port and share an ISDN or dial-up connection. In addition to the gateway functions, the device will work as a print server — just plug a printer into its parallel port.

Once we had the unit cabled, we started looking for the manual. After a moment, we realized the manual was on the CD that was packaged with the unit. We'd have preferred a printed "Quick Start" guide. A look at the PDF had us start our browser and point it at the gateway's IP address. Setup is handled through the Web interface, and except for a few minor rough spots, went well.

We started using the gateway with a local Ethernet connection, to simulate a broadband connection. We told the unit to pick up an address via DHCP, and how to serve the computers on its own LAN ports. It all worked flawlessly. We looked at, but did not evaluate, the port redirection options. These let you make devices on your LAN available from the Internet on a service-by-service basis. That is, when someone connects to Port 80 on the gateway from the outside world, they will be redirected to your Web server behind the gateway. To be useful, this function requires a fixed IP address from your ISP.

Trouble with analog

Once we had the broadband connection working, it was time to try an analog modem — still useful for those who can't get (or won't pay for) broadband, and as a backup when a broadband goes down. We hooked up our modem, connected via the browser, and ran into a brick wall. We couldn't figure out how to configure the gateway to use the modem, or how to configure the modem. We sent an e-mail to GigaFast's help desk and got a reply — with the correct fix — within 12 hours. We felt this was great support for such a moderately priced product.

Once we selected the modem, the configuration screen popped up. We typed in our ISP's phone number, our account name and password, and the gateway dialed up. Again, we could get to the Internet from any of the devices on its LAN segment.

Next, we tried to configure the gateway to automatically call our ISP over the modem when the broadband connection failed. Several of the residential gateways we looked at last time, in particular the SMC 7004 Barricade and the D-Link 713P, will do this. Again, we couldn't figure out how to make it happen. So we sent another e-mail to GigaFast, and again, got a response within 12 hours. Unfortunately, it turns out the gateway doesn't offer fallback capability from the broadband to the serial connection. This was our only disappointment.

After the previous roundup, we purchased an SMC 7004 Barricade for our lab. We found that it had ongoing lockup problems that lengthy discussion with the company's help desk and repeated firmware upgrades failed to resolve. In the end, we replaced the gateway with a Multitech Routefinder 500S. The 500S was rock-solid stable, although considerably more expensive than either the SMC 7004 or the EE400RP. Still, with the exception of the broadband to serial rollover, we liked the EE400RP residential gateway as well as our trusty Multitech 500S. If you don't need the rollover capability, you can save quite a bit of money by going with GigaFast.

Avery is a technology writer in Gunnison, Colo. He can be reached at mavery@mail.otherwhen.com.

Net Results

GigaFast Ethernet EE400RP residential gateway

3.83
RATING

Company: GigaFast, www.gigafast.com **Cost:** About $60. **Pros:** Easy Web setup; very cost-effective; rugged. **Cons:** Doesn't allow broadband-to-dial-up rollover.

What's the score?	Ethernet EE400RP
Management 25%	3
Features 25%	3.5
Installation 20%	4
Price 20%	5
Documentation 10%	4
TOTAL SCORE	3.83

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

Ateonix

continued from page 23

ability to automatically create snapshots of the system, and use them to roll the system back to a point where the data was intact. This gives the users a live back-up and restore capability that offers the exciting ability to quickly recover from data loss because of user error or software problems. At this point, the NASAS-2040 doesn't offer these features. While this is an exciting capability, it doesn't protect the data if the hardware has been stolen or breaks. Smart users will still rely on a tape back-up system, which will let you roll back the system to earlier data (although not as quickly or easily as a snapshot system.)

The NASAS-2040 works with standard back-up packages, but the tape drive will have to be mounted on another device because all the NASAS-2040's I/O expansion slots are occupied. The NASAS-2040 also lets you back up to another NASAS-2040 device with no additional software, but because I only had one NASAS-2040, I couldn't test that capability.

Avery is a technology writer in Gunnison, Colo. He can be reached at mavery@mail.otherwhen.com.

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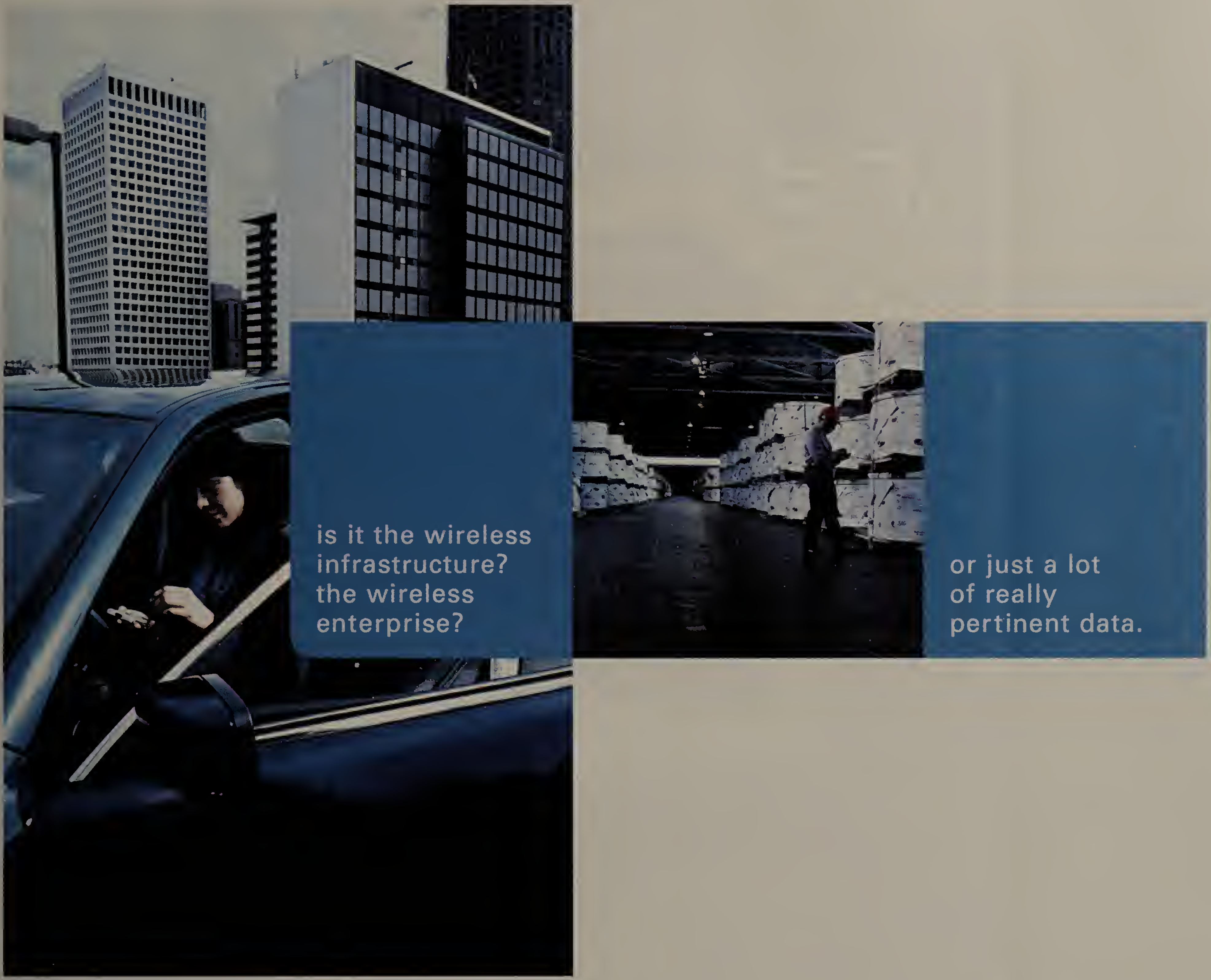
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Forgent aims to manage video networks

■ BY JASON MESERVE

AUSTIN, TEXAS — Administrators with a large deployment of videoconferencing endpoints and network hardware are getting an improved tool for centrally managing their equipment. Forgent's Video Network Platform 2.0 can be used to schedule, set up and monitor video calls, and check the health of each piece of video equipment.

VNP 2.0 uses a Java-based console to

See Forgent, page 32

Short Takes

■ Hoping to attract enterprise customers who are replacing costly Unix systems with alternatives, **Microsoft** has updated its set of tools designed to give Unix users a hand in moving to its Windows operating system. **Services for Unix Version 3.0** adds Windows support for Network File System, a Unix file-sharing protocol. Such support lets Windows clients and servers access files and data stored on Unix servers. Services for Unix 3.0 also lets Windows customers use Microsoft's Active Directory server software to manage and interoperate with Unix directories through the Native Information System server. The package now includes Microsoft's Interix software, which can be used by in-house enterprise developers to recompile Unix applications to run on various versions of Windows.

■ **IBM** recorded far more new license revenue growth than any other application server software vendor last year, but **BEA Systems** continues to lead the market, Dataquest, a unit of Gartner, said last week. IBM outpaced the market with 71% new license revenue growth, giving it a 31% share of the market, up from 22% in 2000. Rival BEA Systems increased its market share by 1% to 34% in 2001 with revenue growing 2%, Dataquest said.

Q&A

Name of the game is integration at IBM

John Swainson is general manager of IBM's Application & Integration Middleware Division — a role that gives him responsibility for middleware technologies including Web application servers, e-commerce servers, transaction systems and application development tools. Swainson recently spoke with Network World *Senior Writer Ann Bednarz about IBM's plans for integrating the IBM family of software products around a core middleware base, including WebSphere as a transactional run-time environment, MQSeries as the secure messaging infrastructure and IBM Directory Server for authentication and security control.*

Is the notion of getting IBM's software family integrated a new direction for IBM?

It's something we've been working on for a very long time. But it's fair to say that all of these things had their own history associated with them. Until very recently, it wasn't at all clear that the market was looking for this degree of integration.

What's changed?

If you think back over the course of the last 10 or 15 years, people have been building systems that tended to be vertically automated. They were building a credit card processing system, or they were building a customer information system, or they were building an [enterprise resource planning] system. The connection between those pieces was not as important as the features that the vertical application provided.

What's happened over the last couple of years is that people have come to realize that a lot of the productivity gains that were gotten by the vertical integration of applications have now been realized. If they are going to get more gains, it's through a horizontal integration of applications into a set of business processes or business flows that literally go from demand to delivery. This idea of trying to standardize on a middleware infrastructure all of a sudden has become top of mind with companies as they look to understand how they can respond to the economic challenges they're facing.

Where do Web services fit in?

I like to tell people that there's nothing that Web services do that couldn't have been done with another technology. It's just that Web services let you do it much faster because the industry has agreed on what the interfaces are going to look like and how they're going to behave.

There have been interface technologies before; there was [Common Object Request Broker Architecture], and Microsoft promoted [Common Object Model and Distributed COM]. But none of these achieved a critical mass in the industry. None of them achieved the de facto standardization that XML and Web services are now achieving.

Web services have become the standardized way with which people can interface their applications. And that's a very powerful, very important technology. But it doesn't change the fact you still have to have robust infrastructure that sits behind it. It doesn't change the fact you still have to have transaction systems. But now it allows me to connect my business with those of my trading partners and my customers more quickly.

Describe the ultimate enterprise integration goal.

What all companies are looking for, whether they are in manufacturing, consumer packaged goods, banking or insurance, is connectedness. They're all looking for the ability to have what's going on in one part of the business reflected, more or less in real time, in the rest of their business. They're looking to understand what's going on in their stores, they're looking to make replenishment decisions in real time based on customer buying behaviors, they're looking to have their suppliers hooked up with them in real time such that decisions about replenishment can be made. If you think about the implications of that from a business perspective, you dramatically reduce the amount of wasted inventory, for example. If you make a mistake, you understand the implications of that mistake instantly and you don't perpetuate it. All these things end up leading to a higher overall margin, higher profitability, more efficient business. This is nirvana from a business perspective. Now I don't think that any of us are naive about the fact that businesses are a long way from this.

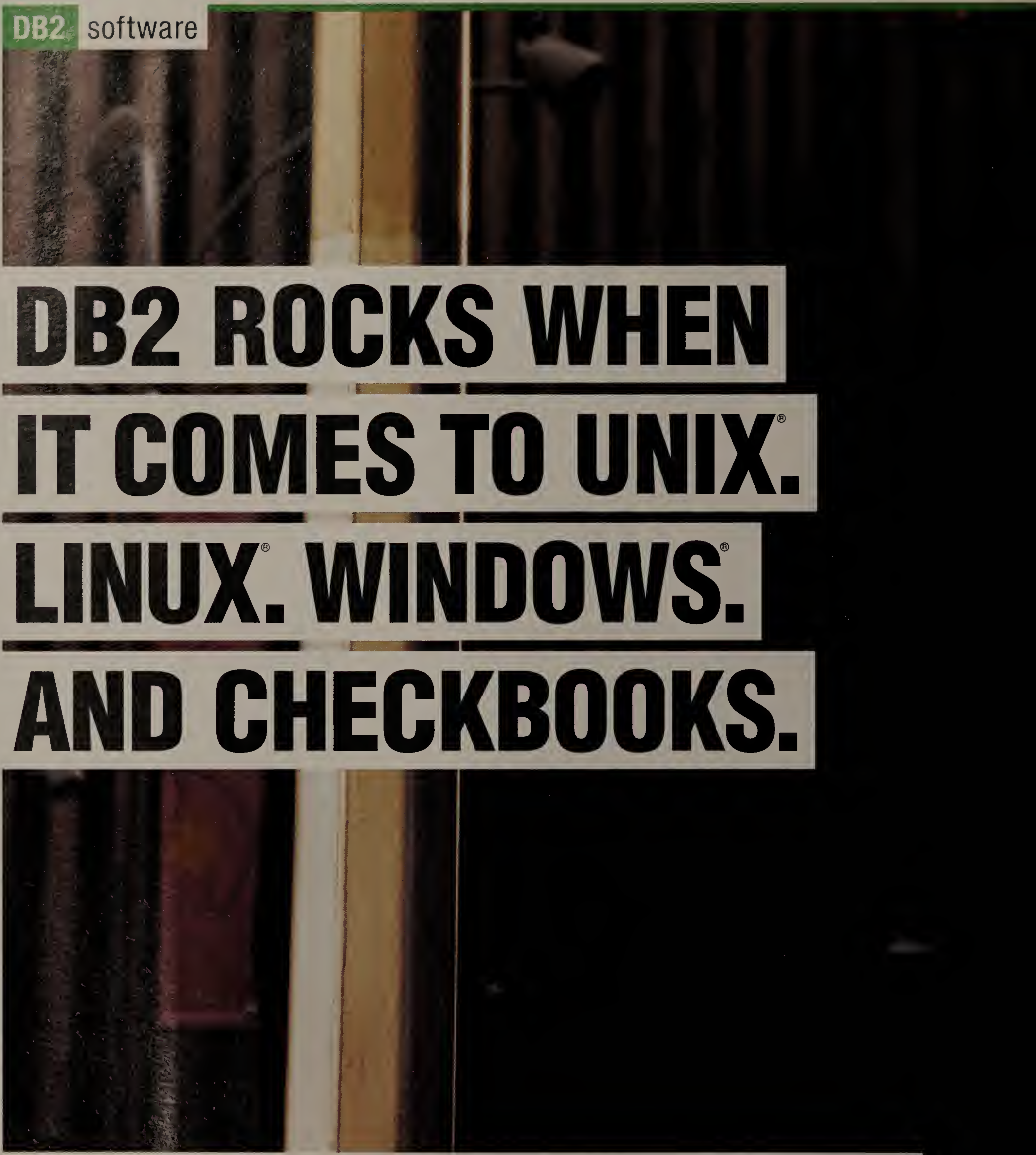
How far along are we?

I haven't seen any data that would allow me to do anything more than guess. My guess is that we are a fraction of the way there. Maybe 10%. We're there enough to know that the benefits are tangible and real.

How is integration technology changing?

Now the opportunity is to link the 30 or more years of investment in IT applications to create a view of a new business process, a new set of process flows, if you will, that can be modified and changed by the business as it sees the market conditions change. This notion of business process flows, business process choreography, is going to be a very important notion going forward here. It's going

See Swainson, page 32



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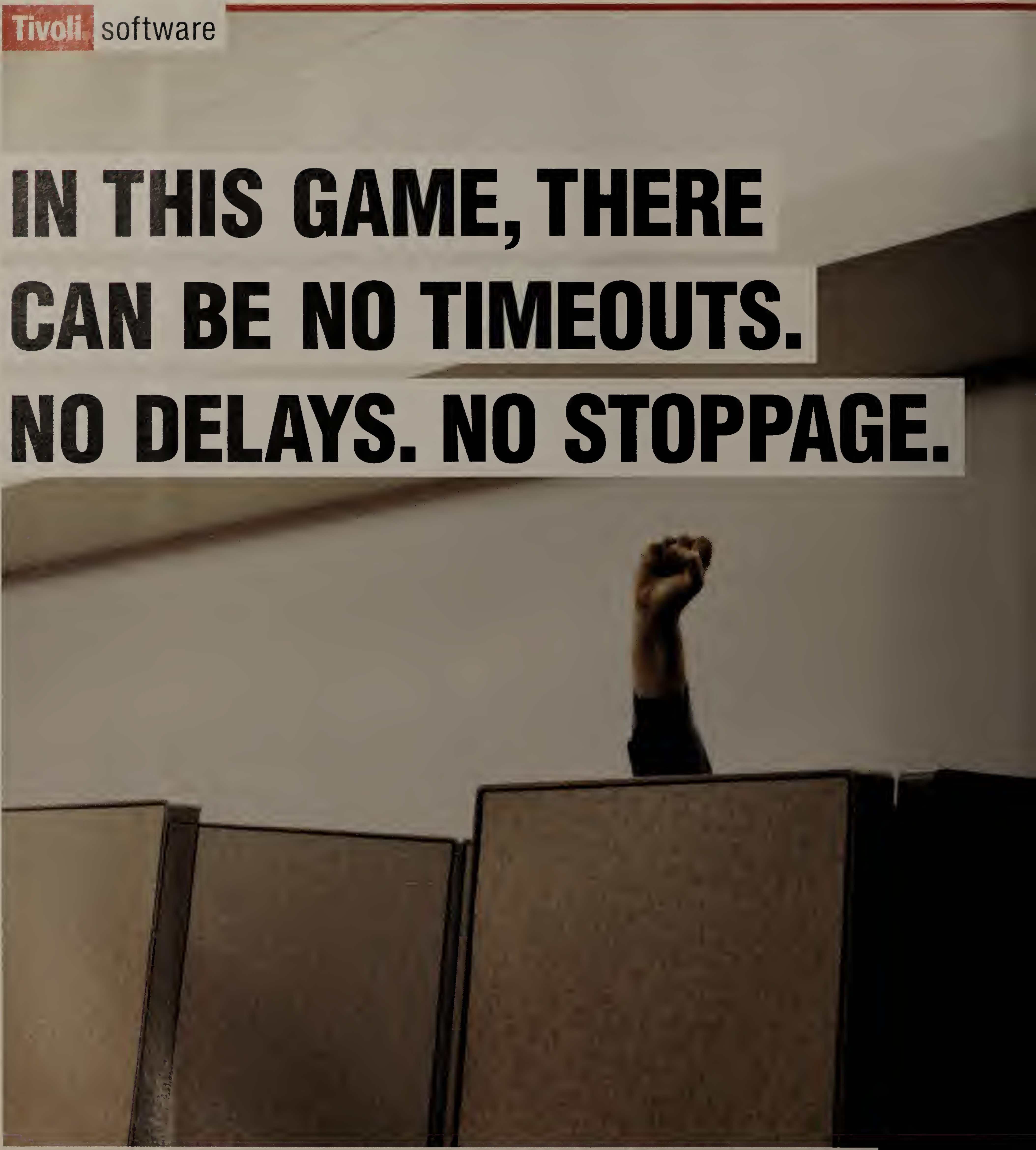

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'NET INSIDER

Scott Bradner

A model of the frustration

New York now fines telemarketers $5,000 per call if they ring someone whom has put his phone number on the state-maintained do-not-call list. The state, which raised the fine from $2,000 a few weeks ago, wants to send a message to would-be messengers.

But in the grand scheme of things, telemarketers who call during dinner are a small problem compared with what individuals and corporations are and will be facing when dealing with the e-mail equivalent.

The telemarketing industry maintains that it is providing a service of use to the public. At least some of the public seems to disagree. *The Boston Globe* reports that one-quarter of New York households have put their phone numbers on the state do-not-call list, 40% have done the same in Missouri and 35% in Tennessee. There is a national do-not-call list that is maintained by the Direct Marketing Association (DMA) at www.dmaconsumers.org. The fact that they require people to use postal mail or pay a $5 fee for the online registration shows clearly that the industry does not actually want people to take advantage of the list.

The DMA also maintains a do-not-send-spam list where registration is free. But the group seems to think that you will miss strangers sending you ads for things that we cannot mention in a polite magazine, so the registration is only good for two years. It's also far from clear how many of the spam artists are members of the DMA. I expect those folks in Nigeria that have upper case-only terminals and want to send you millions of dollars if only you send them a few dollars to start the process are not DMA members. Nor, I expect, are most of the other spammers.

Spam is getting to be a serious burden on many Internet users. I'm up to more than 100 spam messages on an average weekday. Dealing with them takes time, even if I can automatically discard the majority of them using procmail, which comes as a part of the Mac OSX distribution.

Companies are spending more and more effort trying to reduce the amount of spam that gets into corporate e-mail servers in a vain effort to reduce the time wasted while employees read, then delete the junk mail and to reduce the disk space needed to store it until the employee gets around to dealing with it. The tools are getting better, but they're not perfect and some of the tens to hundreds of thousands of spam messages a big corporation gets in a day will get through.

But the U.S. government seems paralyzed by the prospect of actually doing something about the problem. Having the Federal Communications Commission maintain an opt-out list, for which online subscription would be free, seems to be a minimum first step. Of course this should be tied to significant fines to the beneficiaries of the spam (not just the senders) for every message sent in violation of the list. But don't hold your breath.

Disclaimer: Harvard has gotten used to things taking a long time, but this whine is my own.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sobco.com.

Q A

Swainson

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to be as important as the notion of codifying the business rules was in an application environment.

What do you mean by business flows?

All businesses have a flow to them, they all have a process to them. Today, many of those flows in fact are not well understood, not well documented, and have large gaps in them where data needs to be transcribed, or transmitted in a non-electronic fashion. And so the process model for the business is highly inefficient.

How can technology help?

Now technology is ready to step in with tools that start to let you take those processes and automate them. It certainly involves connecting the various elements, but it's not just about connecting. It's also about having a model that you're going to measure against. 'This is how my supply-chain process should work, this is how I'm performing against that process.' This notion of feedback and measurement is incredibly important.

I heard IBM is working on vertical-specific business integration tools. Where will these fit in?

These business process flows actually end up being patterns that are quite similar industry by industry. They aren't identical, but there's a way that an insurance company, for example, deals with its customers that is repeated across most insurance companies. There's a way that a manufacturing company deals with its channels, its customers, its suppliers, its manufacturing capability that is broadly similar from company to company.

Not only are the flows similar but the applications that people use also tend to be similar, so one tends to find SAP in manufacturing and consumer packaged goods, for example. One tends to find i2 [Technologies] or Manugistics for supply chain and maybe Ariba for purchasing. In other industries, one might find Siebel [Systems] as the front end with maybe a homegrown general-ledger system. What one can start to do is put together offerings that are based on these patterns with the sets of adapters and business process models that will make it easier for people to get started.

What's going on with security?

Security has been a big issue for the last couple of years, even before Sept. 11 and of course now after that. We are doing a lot of work with the industry to define what security means, particularly in the context of Web services, which didn't have a security model at all. But we're also working on enhancements to our own directory, and security products for people who are not using Web services. We'll make the Web services and the non-Web services worlds link.

Is some of this available now? What's missing?

We have built into WebSphere a set of technologies from our Tivoli [Systems] colleagues. The products, Policy Director and others, allow me to do rules-based authorization. We have a full [Lightweight Directory Access Protocol] directory built into WebSphere, which is where you store name and address and authentication information. So we have built into WebSphere today a full infrastructure for doing authorization and authentication. Now what's needed is for that infrastructure to talk to other infrastructures. So we need to make it talk to all of the other legacy authentication systems in the world, be they mainframe-based or Unix-based or others, and we need to make it talk to the Microsoft-based authentication systems in the world, be they based on Active Directory or Novell's NDS or other things. ■

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Read the unabridged Swainson interview.
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Forgent

continued from page 27

display schedules, ongoing and completed calls, and a list of all video-related equipment residing on the network. Administrators can drill down into each call or piece of equipment to troubleshoot problems and check overall quality. Virtual gauges can be used to see how much bandwidth is being used by all calls, says Ken Kalinoski, Forgent's vice president of development and CTO.

The VNP software runs on a Windows 2000 or NT box (included in the price) and can automatically discover any SNMP-enabled endpoint, multipoint control unit or gateway on the network, regardless of manufacturer. It can be used to manage ISDN-based videoconferencing endpoints as long as they have some sort of connection to the LAN. A built-in Web server lets end users schedule calls via a standard browser. At a user-appointed time, VNP can automatically connect all the involved parties without user interaction, Kalinoski says.

Customers can abstract information from VNP's transactional database, including alarms, and use it inside traditional network management tools from Hewlett-Packard, Tivoli Systems, Computer Associates and BMC Software. Call data such as duration and bandwidth used can be exported for use in billing applications.

IVCi, an IP video network service provider based in Hauppauge, N.Y., is using VNP to manage its IntelliNet customer base with a total of 30 endpoints, a number expected to rise to more than 100 in the next few months, from its network operations centers in St. Louis and New York. "We use it to take a lot of the problems away from our customers," says Adam Zeitsiff, IVCi's CEO. "Customers do not want to have to pick up the [endpoint's] remote control — they want it done for them automatically."

Although the market for dedicated video network management is much smaller than that for traditional network management, tools such as VNP do have a place and value. "The industry has been crippled by a lack of ease of use and management," says Joe Gagan, senior analyst at The Yankee Group. "The ability to easily and affordably look at a screen, see a problem and fix it right away is key."

Similar products in the market include the Tandberg Management Suite, VCON's Media Xchange Manager and Polycom's Global Management System. The three competitors all market their own endpoints, while Forgent is a neutral party.

Pricing for VNP 2.0 ranges from $35,000 to $100,000, depending on the number of nodes being managed, with an average installation price of $65,000.

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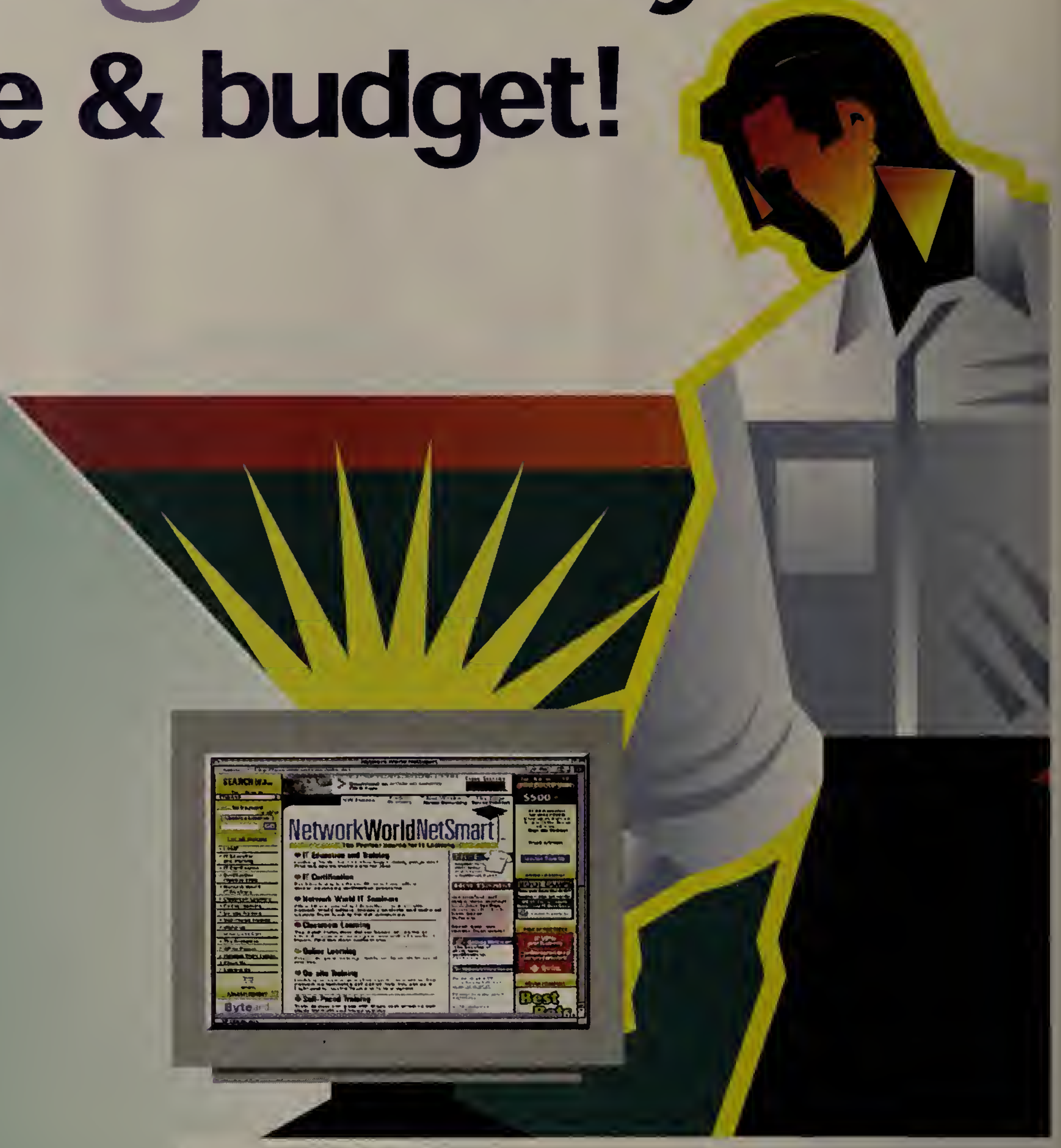

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Short Takes

■ **BellSouth** revealed recently that it will cut between **4,000 and 5,000 positions** as a result of increased competition and a stagnant economy. The cutback will force the provider to take an after-tax charge of $250 million to $300 million. BellSouth gave no timetable for the cuts, but said they would affect both management and nonmanagement positions. BellSouth's announcement came days after fellow regional Bell operating company **SBC Communications** said it would cut about 5,000 jobs.

■ The U.S. Supreme Court last week allowed Verizon Maryland to challenge a Maryland Public Service Commission decision on telecom regulations in federal court. Verizon Maryland sued the commission over its enforcement of the Telecommunications Act of 1996, which requires incumbent local exchange carriers to open their networks to competitive carriers under reciprocal compensation contracts. These are arrangements for a carrier to recover the costs of transporting traffic that originates on another carrier's network. Verizon set up such a deal with competitive carrier MFS Intelenet of Maryland, now owned by WorldCom, and the commission approved the deal. Six months later, Verizon said it wouldn't pay for calls made by Verizon customers to the local access numbers of ISPs — calls that used WorldCom's network — arguing they weren't local calls because they could reach the Internet. WorldCom complained to the commission, which ordered Verizon to pay the compensation.

■ Managed application hosting firm **NaviSite** last week unveiled a set of low-cost, flexible packages designed to give companies an entry point into managed services. The Always On Advantage Series are based on secure, highly available infrastructure and designed to support enterprise applications such as PeopleSoft and Oracle, NaviSite says. The packages are available now and cost from $1,600 to $24,000 per month.

RBOCs on long-distance trek

Businesses may see benefits as early as this summer.

■ **BY MICHAEL MARTIN**

The regional Bell operating companies continue to ring up long-distance victories with federal and state regulatory bodies. As a result, large businesses might begin to benefit from the RBOC successes as soon as this summer.

However, the regulatory picture still remains cloudy and it could take a lot longer for the RBOCs to make major inroads into the enterprise long-distance market.

Two weeks ago, BellSouth became the latest RBOC to win permission from the Federal Communications Commission to offer long-distance services in states where it is the dominant local carrier when the FCC approved BellSouth's applications for Louisiana and Georgia. The states represent BellSouth's first long-distance wins.

Under the Telecommunications Act of 1996, RBOCs are not allowed to offer long-distance voice and data services in states where they are the dominant local voice providers until the RBOCs prove that they have opened their networks to competitors.

So far, Verizon leads the four RBOCs, which also include SBC Communications and Qwest, with six long-distance approvals. SBC has five. SBC and Verizon have sold long-distance services for more than a year, but so far they have concentrated on the consumer and small-business markets.

Qwest, which said early in 2001 that it would file for FCC approval for its first state by the summer of that year, has yet to file for permission to sell long-distance services in any of its 14 states.

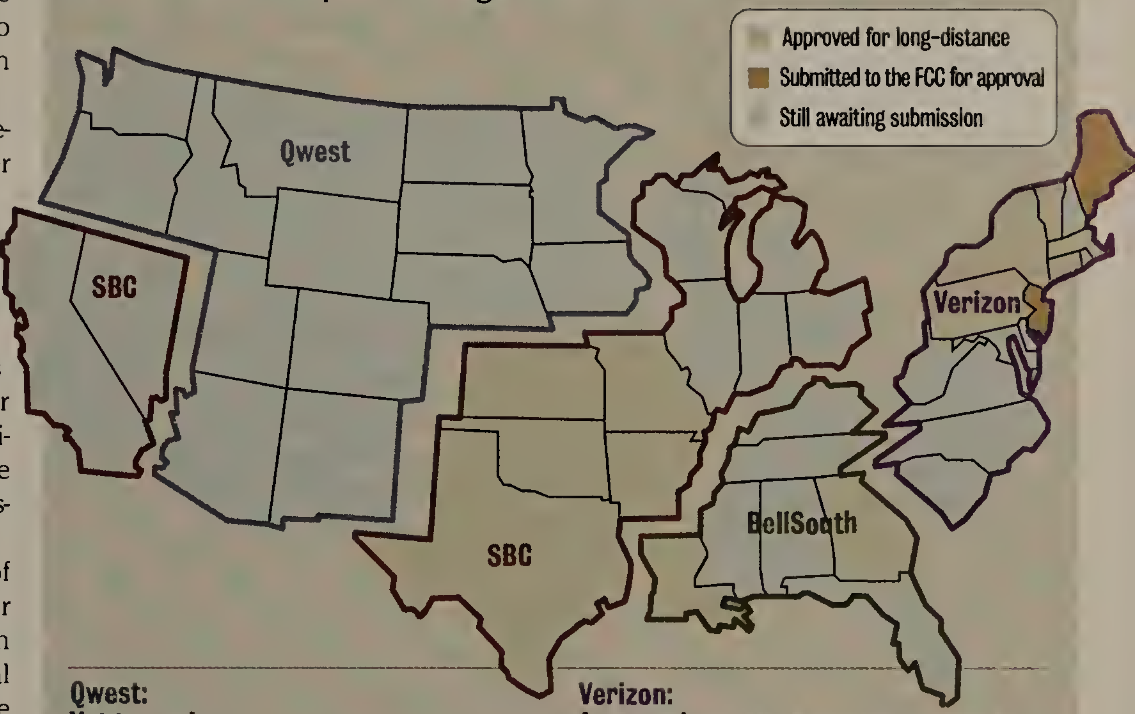
In the meantime, however, Qwest is being investigated by five states for allegedly cutting favorable deals with certain competitors in return for the competitors agreeing to not obstruct Qwest's long-distance applications. These deals would run counter to the telecom act.

Verizon has been the RBOC with the most success in gaining a long-distance foothold. If Verizon gets approval to offer long-distance services in New Jersey, which the FCC has to decide by the end of next month, the RBOC could leap immediately into the large-business long-distance market, says Tom Nolle, president of consultancy CIMI Corp. and a

See RBOC, page 36

Long-distance landscape

The four regional Bell operating companies are making progress slowly in their battle to provide long-distance service.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SBC
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SBC
BellSouth

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SBC:
Approved: Oklahoma, Kansas, Arkansas, Missouri, Texas
Yet to apply: California, Illinois, Indiana, Michigan, Nevada, Ohio, Wisconsin

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Qwest pitching one-stop services

■ **BY JENNIFER MEARS**

DENVER — Network managers steering the move to IP-based applications will find help from service providers that are integrating the different pieces companies need to put business processes onto the Web. The latest to take up this mantle is Qwest with its new Qwest Solutions business unit.

Qwest Solutions is positioning itself as a one-stop shop for bundled and customized services that companies require to solve specific business issues, says Jean Becker, president of Qwest Solutions. So instead of going to different providers, or different departments within Qwest, customers can get whatever combination of systems, services and management they need from a single place.

California Casualty, in San Mateo, Calif., worked with Qwest to figure out a way to better serve its more than 250,000 policyholders nationwide. California Casualty had three regional call centers, but wanted to link those into a single, virtual call center that could

See Qwest, page 36

EYE ON THE CARRIERS

Lisa Pierce

Carrier carnage prompts focus on fundamentals

It's a meat-and-potatoes, back-to-basics kind of year for telecom services. Customers and providers are continuing to focus on the fundamentals: price/performance, coupled with incremental enhancements to services.

The situation is driven, in large part, by the still-dampened economy, and exacerbated by the attacks of Sept. 11. My advice to customers has remained constant: Expect little in the way of true innovation from providers, but demand they continue to improve on those fundamentals.

A quick look at the U.S. telecom landscape explains why hunkering down makes sense.

- The range of carriers facing financial crises grows ever wider, from Global Crossing to competitive local exchange carrier McLeod, metro Ethernet provider Yipes Communications, and just last week, Metromedia Fiber Network. Industry speculation abounds about the future of others, in particular WorldCom, Qwest and Adelphia.
- Wholesale providers have seen prices erode by 30% to 40% in the past two years. First-quarter industry revenues are below last year's disappointing figures.
- Layoffs by major U.S. providers will exceed 30,000 this year. Combined with last year's fallout, the total number of U.S. service provider layoffs will exceed 90,000. The equipment vendor meltdown has been more severe: in excess of 170,000 positions lost.
- Capital investment projections for service providers continue to decline. The little money that carriers are spending is going toward improving their own margins by reducing expenses, not rolling out new products or services.

There is good news amid the gloom:

- In response to customer requirements and near-term top-line concerns, carriers are providing customers with attractive multiservice contracts for terms of two years. Negotiated prices for voice, private line, frame relay and ATM services continue to erode: on average 10% to 15% compared with 2000. T-1 access line prices continue to fall, particularly on the wholesale side, which translates into some benefits for customers who use interexchange carrier-coordinated access.
- In response to lack of customer interest in quickly migrating to new services, long-haul providers are giving renewed life to mature services, which have better records than new services anyway. Recent evidence includes WorldCom's Bundled Frame Relay and Economy Frame Relay packages, and Broadwing's PLX Multiconnect T-1/T-3 private-line service. The aim of both services is better prices in hopes of an upswing in customer adoption.

Hybrid IP-Frame Relay services also offer customers some of the performance comfort of traditional Layer 2 frame networks, combined with some of the cost-attractiveness promised by fully meshed router-based IP networks. These providers continue to roll out incremental improvements to newer (IP-centric) services. Examples include recent announcements by three major providers to induce customer interest in their converged (voice-over-IP) services, and by Sprint's announcement in January concerning its upcoming site-to-site IP VPN service.

Many companies are turning their attention to local expenses and are looking for incumbent local exchange carriers (ILEC) to find creative solutions to their pain points. This is an ongoing struggle.

Our client feedback regarding ILEC responsiveness to their concerns is mixed, at best. Companies continue to find that ILECs fall short in meeting their expectations regarding billing, customer support, prices, installation and maintenance.

One last note: In a recent conversation with a group of clients, all agreed that in the midst of a vast sea of disappointing performance, the Ameritech portion of SBC Communications is the worst.

Pierce is a research fellow at Giga Information Group. She can be reached at lpierce@gigaweb.com.

Qwest

continued from page 35

dynamically provide whatever information a policyholder needed.

Qwest designed an integrated voice response system, which California Casualty manages in-house. The system includes Qwest's Web contact center, which is based on open standards including Voice XML, enabling access to the Internet via telephone; Web services; and Cisco's Intelligent Contact Management software, which manages business-to-consumer interaction over the Web, e-mail and phone.

Keith Felton, telecommunications systems manager at California Casualty, says it makes sense for Qwest to provide integrated services.

"Qwest brought us an integrated solution that included partners, professional services and technology. This complete solution is what we needed," he says.

Qwest Solutions integrates Qwest's stand-alone capabilities, such as networking, security and applications management. Qwest Solutions can design, deploy and manage IP systems, or can help customers with any of those phases.

Qwest has long partnered with Hewlett-Packard and IBM for hosting, and recently announced a partnership with Nortel to provide capabilities such as managed optical services. Other partnerships will follow, Becker says.

All in one

Qwest Solutions is designed to provide customers with end-to-end service, the company says. The six areas Qwest Solutions addresses are:

- Business applications.
- Computing solutions.
- Contact center.
- Enterprise networking.
- Security.
- Telephony and convergence.

Analysts say Qwest is smart to offer integrated packages. Other companies such as AT&T Solutions also are offering packages of services.

"Carriers have finally gotten the message that businesses don't want to hear about the next great technology," says Courtney Quinn, a senior analyst at The Yankee Group.

"It's interesting to them. But what's really interesting to them is the business problem that that technology is going to solve."

Pricing for services from Qwest Solutions varies greatly, a spokeswoman says. "For instance, a customer might only want a single router managed, which can be as little as $100 per month, or a global enterprise company might ask Qwest Solutions to integrate several disparate IP networks around the world, which can be a multimillion-dollar project," she says. ■

RBOC

continued from page 35

Network World columnist.

"With the acquisition of New Jersey [long-distance], Verizon acquires the Northeast corridor enterprise market," Nolle says.

Verizon's local territory accounts for between 45% and 48% of the large corporate headquarters in the U.S., he adds. If Verizon sells long-distance services when it gets approval for New Jersey, it also could push SBC into the long-distance market in the Northeast. That could be the case because SBC would be hesitant to give Verizon a head start, Nolle says.

Hank Levine, a partner in Levine, Blaszak, Block and Boothby, a firm specializing in telecom contract negotiations, isn't so sure the RBOCs will be quick to break into the large-business long-distance market. The reason is that large companies typically have offices throughout the U.S. While an RBOC might be able to offer these potential customers long-distance services in most states, large companies would be unlikely to consider an RBOC if they had to go to the trouble of cutting side deals for states where the RBOC didn't have permission to offer long-distance, Levine says.

In the meantime, the RBOCs could serve regional companies that had offices only in certain states where the RBOCs had long-distance approval.

However, Levine says the RBOCs so far have focused on the consumer and small-business long-distance markets. There are two reasons why these targets might be more appealing, at least in the short term. The first is that the RBOCs already have good brand recognition with the consumer and small-business markets. The second is that they might not yet be prepared to deal with the added strain of serving large businesses and their very particular support requirements.

While Verizon and SBC might appear to be close to getting long-distance approval for most of their states, Levine believes it will be at least another year to 18 months before either provider has approval for all of its local territory. The final states may prove more difficult to win over than the early ones, he notes.

"A lot of these companies have one or two states that really hate them," Levine says. For instance, he says, SBC could have some trouble dealing with California, a former Pacific Bell territory, and with the former Ameritech states, including Illinois.

Whether the RBOCs will break into the large-business market through building their own salesforce, or acquiring an interexchange carrier (IXC), is still up in the air.

Any IXC acquisition by an RBOC would require the RBOC to cut loose all the IXC's long-distance customers headquartered in states where the RBOC did not have long-distance approval. It's unlikely there would be any activity until an RBOC has obtained long-distance approval in all its local states.

For example, Nolle says, BellSouth and AT&T would likely want to merge their operations. But because BellSouth still needs long-distance approval in five states, that's not likely to happen any time soon.

Also, with the layoffs some IXCs have made and the large pool of unemployed competitive local exchange carrier staff, Levine says, there's a lot of sales and support talent the RBOCs can pick up to staff their own large-business long-distance operations.

Once the RBOCs decide to enter the large-business long-distance market, it could lower prices beyond their already low levels, Levine says. Like any new entrants, RBOCs will likely have to lure customers through favorable deals, such as offering two-cent long-distance minutes instead of three-cent minutes. ■

More online!

See why RBOCs' long-distance bids may not lead to success in the enterprise.

DocFinder: 9532

The Edge

■ SERVICE PROVIDER DEVELOPMENTS
AT THE JUNCTURE BETWEEN THE ENTERPRISE
AND THE NEW PUBLIC NETWORK

Packet Design delves into IP brainwork

Start-up brings circuit-switched telephony concepts to routed networks.

■ **BY JIM DUFFY**

MOUNTAIN VIEW, CALIF. — Packet Design last week unveiled an appliance that manages the brains instead of the body of an IP network.

Route Explorer lets network operators look into the IP network "cloud" and see the actual routing paths being traversed by traffic.

Typically, router management is done on a hardware-element level, where SNMP agents monitor the status of physical Layer 2 links, ports, modules and the entire stand-alone system. This technique is limited in its ability to provide a complete picture of how the network is operating, Packet Design says, because operators have to rely on correlated device-status information to get a "view" inside the network.

Route Explorer monitors the router control plane — the intelligence of the system that processes protocols and calculates routes. The product uses the routing protocols to gather and display Layer 3 information on end-to-end routing paths, online and historically.

Route Express brings to IP the type of management typical in circuit-switched telephony networks, says Dave Passmore, research director with The Burton Group. These networks require operators to preset static circuit paths between nodes.

"It's truly amazing to me that nobody did this before," Passmore says. "It's so obvious and straightforward. Grad students should have developed this a long time ago."

Route Explorer presents a routing-level view of networks that lets operators see routing-path changes and anomalies as they happen, Packet Design says. The appliance has two main architectural elements: Route Recorder and Route Explorer.

Route Recorder is a discovery engine that "listens" to the network's routing control plane and builds a routing topology map, logging all routing events in a local database. Route Explorer creates a picture of this information, displaying the routing topology and any changes shortly after they occur.

Starting from a high-level view of the network showing all active routes and routers, an operator can highlight one route between any two locations and view the details — link state, link metrics, router parameters — of the routers along that route.

The network can be displayed in its entirety, hierarchically or selectively — showing only backbone routers and links, for example.

Route Recorder and Route Explorer both reside on one network appliance. Unlike common SNMP management tools, Route Explorer adds no monitoring traffic to the network, so one appliance can support a network of thousands of routers, Packet Design says. The visualized data can be displayed and manipulated from a remote console.

An animated historical playback and analysis feature lets operators diagnose problems such as the intermittent router failures known as "route flaps," which can degrade network performance. Route Explorer also can import information on Multi-protocol Label Switching tunnels or data collected with an application such as a multirouter traffic grapher, and correlate it with the accumulated topology history to pinpoint the effects of routing on performance parameters such as link utilization, delay and packet loss, the company says.

Users can "rewind" and "replay" the network topology map from the point at which it began logging data. Starting with a coarse "fast forward" playback from the time a network service problem was detected, an operator can slow the playback to step through individual routing events and other correlated data to gauge the effect on the network, Packet Design says.

Route Explorer also lets users show specific routes on network maps and then observe the potential impact of bringing down links or changing router parameters along that route on how the network operates. This would help an operator understand the impact of network failures on customers and to incorporate the optimal level of redundancy into a network, Packet Design says.

Initially the system supports Open Shortest Path First and Intermediate System-to-Intermediate System routing protocols. Support for additional protocols, such as Border Gateway Protocol (BGP), will be added later.

Although the product currently lacks BGP — the predominant protocol in service provider networks — Passmore says it's still more applicable to large ISP networks than smaller enterprise networks.

"The network needs to be fairly large to benefit from this," Passmore says. "This is most applicable to large mesh network topologies."

Route Explorer, priced at $25,000, is in lab trials with general availability scheduled for the third quarter.

Packet Design, founded in May 2000 by husband-and-wife entrepreneurs Bill Carrico and Judy Estrin, develops technologies designed to enhance the performance, scalability and manageability of the Internet. It conducts research and development through the product prototype stage, with marketing done through separate venture-funded spinoff companies, technology licensing agreements or, most recently, directly.

Packet Design's first spinoff, Vernier Networks, addresses security, management and control of wireless LANs.

Packet Design is the fourth network company that Estrin and Carrico have started. The company has raised $29 million in private funding from Foundation Capital, Sun and individual investors.■

■ PROFILE: PACKET DESIGN

Location:	Mountain View, Calif.
Founded:	May 2000
Business:	Packet Design develops IP technologies designed to enhance the performance, scalability, provisioning and ease-of-use of Internet infrastructure.
Management:	Judy Estrin, president and CEO; Bill Carrico, chairman of the board; Van Jacobson, chief scientist.
Target Customers:	Service providers and enterprises.
Employees:	Employees: 38
Fun fact:	Packet Design is the fourth company founded by husband-and-wife entrepreneurs Carrico and Estrin.

Short Takes

■ Edge router start-up **Laurel Networks** last week announced **RFC 2547bis**-based Multi-protocol Label Switch IP VPN support for its **ST200** router. The ST200 currently is deployed in production networks in the U.S. and Europe, with ST200 IP VPN software entering carrier trials next month. The company is believed to be on the short list for an edge buildout at Cable & Wireless. RFC 2547bis specifies use of the Border Gateway Protocol to let provider edge routers administer and share subscriber VPN tables. The Internet Engineering Task Force document has garnered a lot of support recently from router and multiservice switch vendors — many of which will showcase support for it in the largest MPLS interoperability demonstration to date next month at **SuperComm.** Laurel's implementation of 2547bis extends existing Layer 2 VPN support announced in September 2001. Laurel's Layer 2 VPN support is based on IETF Draft Martini and lets carriers offer ATM, frame relay and Ethernet private-line services, the company says.

■ **WaveSmith Networks** last week announced that former FORE Systems President and CEO **Thomas Gill** has joined the company's board. Gill helped guide FORE from start-up mode to a public company with revenue approaching $1 billion annually. He sold FORE to Marconi for $4.5 billion in 1999. Currently, Gill is founder and managing partner of G4 Partners, a management, financial and investment services firm for emerging technology companies.

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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

UDDI is Yellow Pages of Web services

■ BY GREG GOVATOS

Web services can be defined as loosely coupled software components delivered over IP networks. The primary objective of Web services is to simplify and standardize application interoperability within and across companies, leading to increased operational efficiencies and tighter partner relationships.

A Web service architecture consists of three primary functions: discovery, description and transport. For each of these functions, there is an accompanying standard, all based on XML. Web services are discovered through Universal Description, Discovery and Integration (UDDI), described by Web Services Description Language (WSDL), and transported using Simple Object Access Protocol (SOAP). Web service transactions run over HTTP and TCP/IP networks.

The typical Web service transaction flow occurs after a Web service is built by a Web service provider, a description of the service is posted to a Web service registry. The registry is a searchable index of service descriptions through which Web services can be located and executed.

The Web service requester (the entity in need of a Web service) searches the service registry and finds the desired service description. Through the information the requester finds in the registry, the requester connects to the Web service provider and invokes the service.

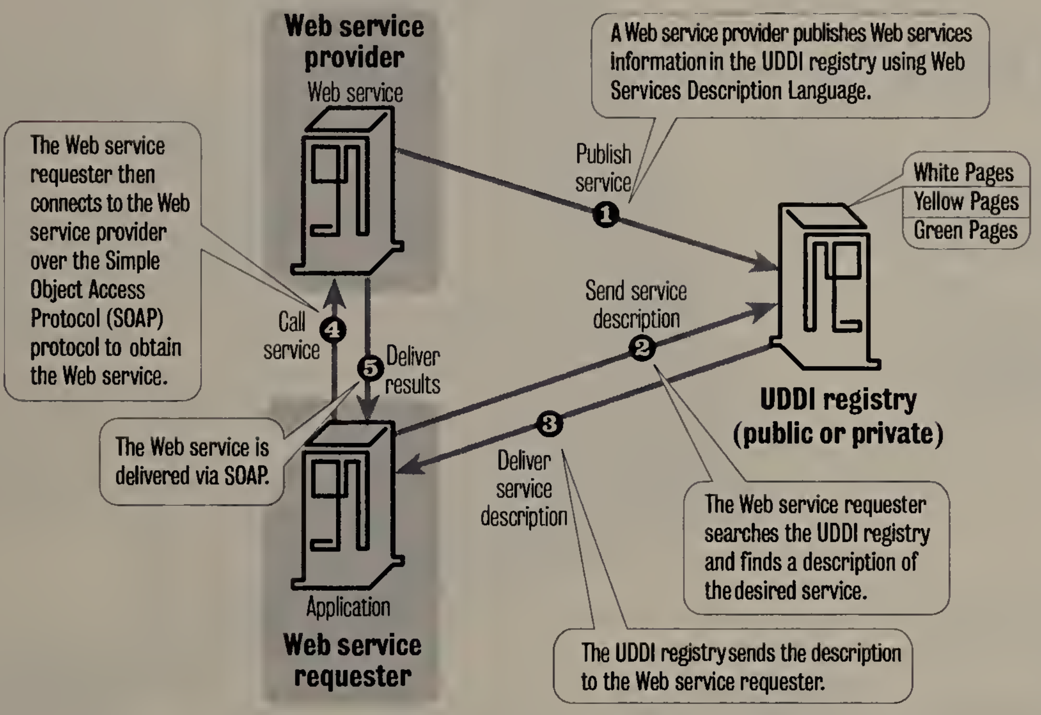
Got great ideas?

■ Network World is looking for great ideas for future Tech Updates. If you've got one, and want to contribute it to a future issue, contact Features Editor Neal Weinberg (nweinberg@nww.com).

■ HOW IT WORKS

UDDI

Universal Description, Discovery and Integration provides a way to find Web services via a services registry.


Web service provider
Web service
A Web service provider publishes Web services information in the UDDI registry using Web Services Description Language.
Publish service
1
White Pages
Yellow Pages
Green Pages
The Web service requester then connects to the Web service provider over the Simple Object Access Protocol (SOAP) protocol to obtain the Web service.
Call service
4
5
Deliver results
Send service description
2
UDDI registry (public or private)
The Web service is delivered via SOAP.
3
Deliver service description
The Web service requester searches the UDDI registry and finds a description of the desired service.
Application
Web service requester
The UDDI registry sends the description to the Web service requester.

At its foundation, UDDI is a group of specifications that lets Web service providers publish information about their Web services and lets Web service requesters search that information to find a Web service and run it.

Under the covers, UDDI consists of an XML schema that defines UDDI's four core data structures — business, service, binding and programmatic interface — and a set of APIs that operate on those structures. UDDI was developed by IBM, Microsoft and Ariba, and is now under the stewardship of the UDDI Community (www.uddi.org), which has more than 200 member companies. UDDI is currently at Release Level 2.0; Version 3.0 is under development.

A Web service listing is created using WSDL and then sent to a UDDI registry. A listing is comprised of three elements. At the highest level there are White Pages, which contain basic information about the providing company and its services. Next are Yellow Pages, which organize services by industry, service type or geography. Finally there are Green Pages, which include the technical mechanics (such as interfaces and URL locations) about how to find and execute a Web service. An application requesting a service will use WSDL to electronically interact with the Green Pages section of that service's listing.

The architecture of UDDI allows for public and private registries, with private registries accessible by business partners across an extranet and within an organization over an intranet. Private registries are expected to achieve earlier adoption than public registries, because Web services are first being deployed by corporations inside the firewall. For corporations, UDDI registries provide a key advantage over standard software release management practices. As new or updated versions of a Web service are released, a UDDI registry lets the service be put to use immediately by the requesting application without any recoding or reintegration work.

While UDDI registries appear to offer for Web services what search engines did for the World Wide Web, a few problems are hindering their broad rollout. First, the UDDI specification has not been finalized, which is causing companies to pause before committing resources. Also, the categories of a registry have not been standardized, making searches tedious. Further, UDDI lacks the authentication features needed to restrict access to trusted applications. Companies will not expose business-sensitive Web services in a nonsecure environment. Finally, there are not enough production-level Web services available to warrant the widespread use of registries.

Govatos is the vice president of Chutney Technologies, which develops software for optimizing Web service infrastructures. He can be reached at greg@chutneytech.com.

Ask Dr. Internet

By Steve Blass

I understand the theory behind Address Resolution Protocol, but how does a remote machine differentiate between different media access control addresses of machines on the same subnet by sending out FFFF.FFFF.FFFF for the destination MAC? The sender wants a reply from the DNS box.

ARP works by broadcasting the request to every station under the convention that only the machine that "owns" the IP address being requested will answer the ARP request by sending the answer (including the correct MAC address) directly to the requesting station. ARP requests are broadcast to the whole segment. The requester fills in its own MAC and IP address in the sender address fields, and puts the known IP address of the target in the target IP address field. In addition, the requester puts all ones in the target MAC field (FFFF.FFF.FFFF is the Ethernet broadcast address). The replying machine (which is either the owner of the IP address being sought or the router that knows the way) replaces the broadcast address with the target's MAC address, swaps the sender and target pairs, and unicasts the answer directly back to the requesting machine.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD
INSIDE THE
NETWORK
MACHINE
Mark
Gibbs

Dress up your e-mail

This week we stumbled across an e-mail program that is pretty interesting. It is called IncrediMail Xe and it combines some really nice, and potentially beneficial graphical message formatting with some irrelevant (in practical terms) but amusing presentation fripperies.

IncrediMail Xe is from IncrediMail, Ltd. (www.IncrediMailXe.com) and is, at its heart, a free and simple Windows 95/98/Millennium Edition/NT/2000/XP, Post Office Protocol 3/Simple Mail Transfer Protocol mail client that includes support for HotMail and MSN accounts (no Internet Message Access Protocol 4 support).

Installation is a breeze. When the program is launched, the screen divides into four panes, going clockwise from top left: Folders (a list of mail folders), the contents of the currently selected folder, the contents of the currently selected item in the folder and Key Contacts (selected entries from the recipient directory accessed from the menu).

The last two panes feature a neat idea — a bar at the bottom of each. When you click on a bar, the pane collapses enlarging the pane above. Click again and it is restored.

Status messages are displayed in a small panel to the right of the menu and tool bands. If you haven't purchased the premium version ($30), the small panel displays ads when nothing else is happening (in the premium version you can right-click to switch on ad display but we're not sure who would want to do this).

The premium version also suppresses the automatic inclusion of an IncrediMail Xe footer with a link to the company, gets you technical support, provides a "preview on server" facility to view headers and select those to be downloaded.

So far it sounds like a standard e-mail client, but what IncrediMail Xe does well is support formatting. In effect it makes e-mail far more "dressed up."

"So ...?" some of you may be saying. Well, Outlook, Eudora and the other leading clients are great, but frankly they overwhelm many people. They all have so many features and options, and integrate with other complex applications that less-experienced users have trouble focusing on what they are trying to do: communicate.

IncrediMail Xe scores by letting users select stationery, add animations, sounds and "e-cards." In other words, snazz up their e-mail with some style.

The underpinning of this dressing up is HTML mail, which is the default for IncrediMail Xe (plain text can be selected, if required).

When you open a new mail item, another window appears on the left, locked to the composition window. This window shows the formatting options. You can select only one item from each option: one background, one animation and one sound. The other option is e-cards, which are really sets of options. If you select an e-card, all other selected options are overridden.

GEARHEAD RATING

9

IncrediMail, Ltd.

IncrediMail XE

1=awful,
10=insanely great

The fripperies are found in sending and receiving messages, and with opening and deleting messages. These all can be accompanied by animations that can be specific to message formats. These make the interface more interesting and less daunting for new users.

IncrediMail Xe also supports graphical signatures; graphical emoticons; a voice message recorder; notifiers (desktop animations that pop up to announce new mail); and an editor to create your own e-mail templates. The latter is a separate purchase — $40, or in a bundle with IncrediMail Xe for $50).

IncrediMail Xe is terrific. It provides a reasonably simple user interface that will lead to quick learning and that will encourage users to think about content and style as being important. IncrediMail Xe gets nine gearteeth out of 10.

In another matter, Dirk Bulinckx, the author of Servers Alive, a network management tool we reviewed last week (www.nwfusion.com, DocFinder: 9534), responded to our complaint about a lack of templates for generated HTML pages. He pointed out that one rough-and-ready example is available, as is noted in the documentation (see www.nwfusion.com, DocFinder: 9535).

Dirk's right: That template is a starting point. But we'd still like to see more templates, as Servers Alive has some pretty slick Web page-generating abilities and most of us don't have time to go from first principles.

Send your important style and content to gearhead@gibbs.com.

Cool Tools

Quick takes on high-tech toys

By Keith Shaw

Sony announces third AIBO robot dog

Sony recently announced a third model of its AIBO Entertainment Robots, the AIBO ERS-31L. The "dog" comes in caramel brown, features a look similar to a bulldog or pug, and will cost $600, the company says.

The robot is expected to take a picture on command (by saving a JPEG image onto a Memory Stick card), and includes more than 200 new moves and dances, as well as new responses. The robot also has a 75-word vocabulary, and new interactive and expressive sensors, Sony says.

The company says it will begin taking orders on June 3 via www.us.aibo.com.

Sony's new robot dog takes pictures on command, and can answer back with a 75-word vocabulary.

Control 32 computers with new USB KVM switch

Network Technologies, Inc. recently announced the USB Matrix KVM Switch, which lets up to eight users command or simultaneously share up to 32 USB-enabled computers via USB keyboards, mice and VGA monitors.

The switch features NTI's electronic autoboot technology, which lets a user boot all attached computers in one operation. USB host computers and devices can be plugged in or removed at any time, and the switch can be powered down without having to reboot attached computers, NTI says.

The switch supports Sun (including Sun Blade 100s, 1000s, Sun Rays and Sun Fire 280Rs); PCs with USB ports; and Mac G3s and G4s. It lets users choose the layout keyboard (PC, Mac or Sun) through emulation, in which keystroke translation and special keys are programmed into the switch. Prices range from $1,200 to $10,000, and the switch is available now. Go to www.nti1.com for more information.

Presenter-to-Go launches Palm-enabled products

Margi Systems has announced that its Presenter-to-Go products, which enable end users to show PowerPoint and other files on their handheld devices, will be available next month in Secure Digital-based format for Palm handhelds.

The software and hardware will support Palm m125, m130, m500, m505, m515 and i705 handhelds. The platform will let end users present any PowerPoint or printable Windows application on their Palm handhelds at a 1,024-by-768-pixel resolution. It includes a print driver that can be installed into an application that lets documents be transferred to the handheld.

The product comes with an Secure Digital Card/cable that connects the Palm device to a projector, as well as a 14-button infrared remote control, an AC adapter and the Presenter-to-Go software for transferring files to the handheld. The package costs $200 and will be available next month at www.margi.com and other resellers.

Intermec announces rugged, color handheld

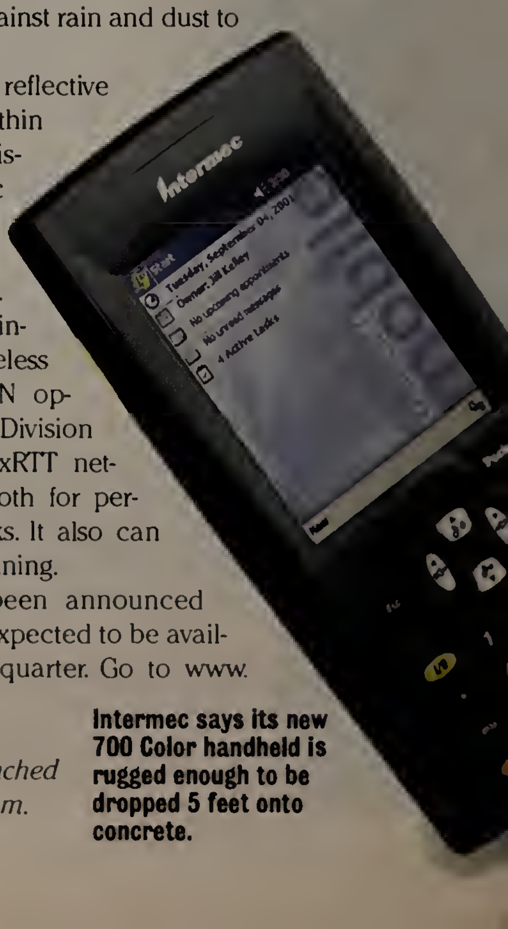
Intermec Technologies last week launched its 700 Color mobile computer, a rugged handheld that adds a large color display, Intel's new xScale PXA 250 processor and Microsoft Pocket PC 2002 operating system. The device can integrate three radios to expand on connectivity options.

Rugged features on the device allow it to be dropped 5 feet onto concrete, the company says. In addition, the device is sealed against rain and dust to IP64 standards.

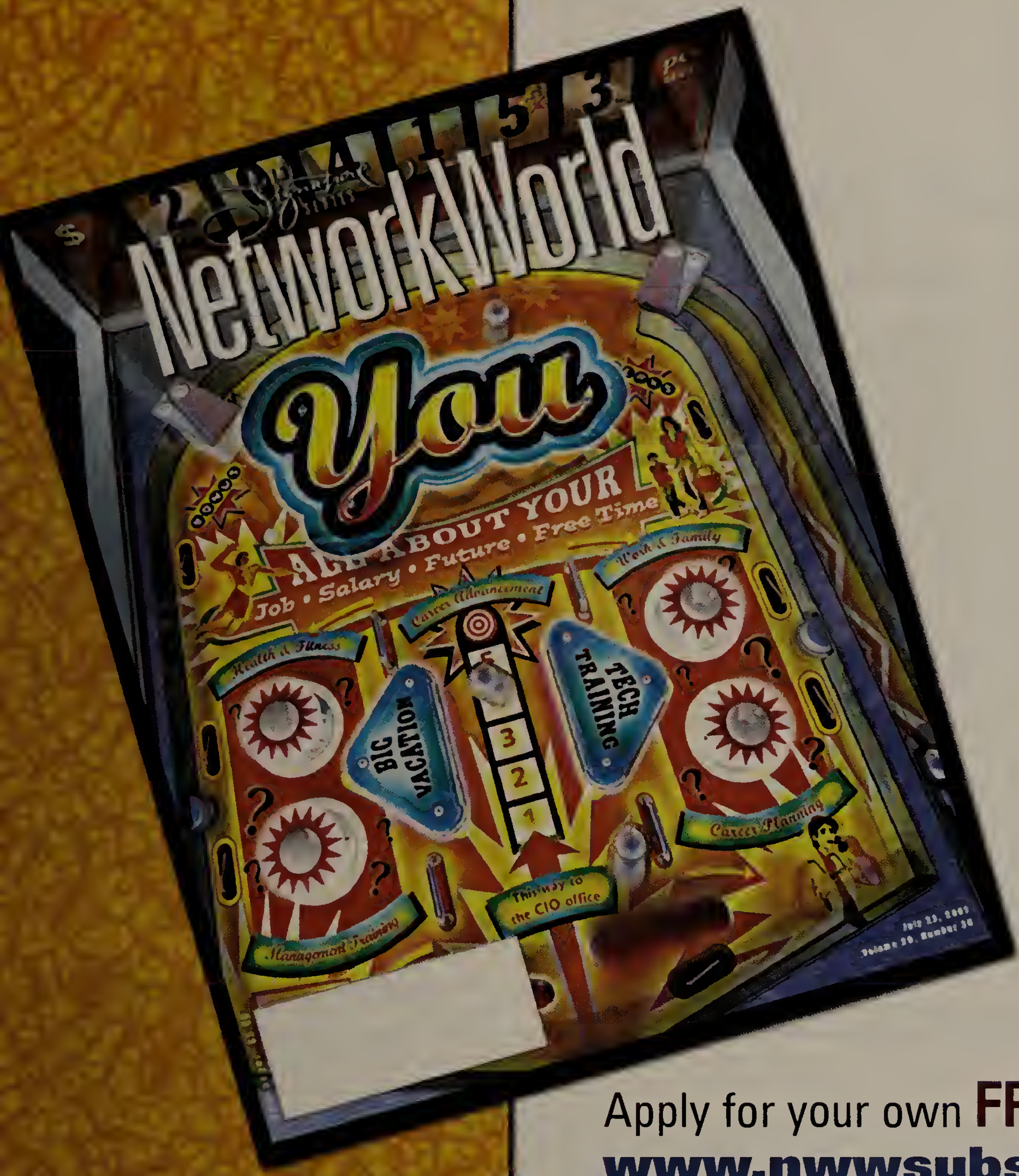
The device has a reflective 3.8-inch diagonal, thin film transistor display that Intermec says is 20% larger than most other handheld devices'. Wireless options include 802.11b wireless LAN, wireless WAN options such as Code Division Multiple Access 1xRTT networks, and Bluetooth for personal-area networks. It also can offer bar-code scanning.

Pricing hasn't been announced yet. The device is expected to be available in the third quarter. Go to www.intermec.com.

Shaw can be reached at kshaw@nww.com.



Intermec says its new 700 Color handheld is rugged enough to be dropped 5 feet onto concrete.



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EDITORIAL
John Gallant

AT&T Broadband joins debate

A few weeks ago, I slammed AOL Time Warner for refusing to stand up with its rivals in the broadband services arena and debate the issues that are critical to you, the buyers.

Now I extend a hearty welcome and a tip o' the hat to AT&T Broadband, which has taken our challenge to participate in the *Network World* Broadband Showdown on June 5 at SuperComm in Atlanta. (For information on the time and location, go to www.supercomm2002.com.)

AT&T Broadband — the largest cable television company — will join SBC Communications, DIRECWAY and WorldCom in a debate among providers of the most important broadband technologies. AT&T Broadband will represent the cable modem business, of course, while SBC speaks for DSL, DIRECWAY for broadband satellite access and WorldCom for fixed wireless.

AT&T, SBC and WorldCom have a strong tradition of support for *Network World* Showdowns, and we applaud them for taking part in several debates over the years. We're also pleased that newcomer DIRECWAY has stepped up because we believe this presidential-style debate format helps customers quickly and more easily sort out differences in technologies, corporate strategies and market directions.

Broadband access is one of the most important issues facing the U.S. today. Affordable, widely available broadband would go far in re-energizing the growth of the economy and spur the development of many new applications — from conferencing to entertainment.

Today, cable and DSL are the clear leaders in the broadband portfolio. But satellite and fixed wireless hold great promise for extending broadband's reach. The Broadband Showdown is designed to explore the strengths and weaknesses of these technologies, while also highlighting the strategies of the leading suppliers.

During the debate, I'll be joined by Amy Harris, program manager for broadband markets and technologies with IDC, in asking the vendors tough questions. We'll focus on their deployment plans, their pricing strategies, what they offer consumers and business customers, and how they support their offerings. After that, the vendors will ask each other questions and we'll take queries from the audience.

The key here is that vendors won't be allowed to give lengthy marketing spiels, and they won't know in advance what anyone will ask. That ensures that we quickly spotlight differences among the companies and get to the meat of the issues shaping the broadband market.

So thanks to AT&T Broadband, SBC, DIRECWAY and WorldCom. As for you, make plans to join us.

— John Gallant
Editorial director
jgallant@nww.com

Vendor liability

Regarding your Face-off on whether vendors should be held liable for their products' security flaws (www.nwfusion.com, DocFinder: 9526):

As a security analyst who has dealt with many vendors on business unit projects, the refrain I hear constantly is, "But customers aren't asking for security." Indeed, businesses are focused on features and ease of use. Problems arise when customers try to integrate products into a particular security architecture, and it slows down the implementation (usually after the product has already been accepted). It's a two-fold problem: Vendors are not building secure products because customers are not asking for security — and customers are accepting products even if there are significant security vulnerabilities. In my opinion, customers need to stand up and say they want security first, before there is legislation that enforces something that neither vendors nor customers want at this time.

Rick Carlin
St. Paul, Minn.

I firmly believe software companies should be held liable and punished for intentionally deceptive marketing practices designed to misrepresent the function, reliability, privacy and security of their products. It's not enough to simply refund the purchase price when known flaws cause a loss of personal privacy, loss of business clients or worse.

Software security would not be such an important issue if computers were only used by large companies with expert IT organizations. And it wouldn't be so critical without worries about terrorism and national defense. But now computing and networking have extended beyond enterprise IT, and into small businesses and consumer households, and neither have the understanding and skills needed to protect themselves with add-on security measures. We just can't push all of the responsibility for personal privacy, business security and national defense onto individual consumers, and we can't continue the practice of hiding known and serious security flaws and product defects.

Wayne Caswell
Austin, Texas

Excusing software vendors from liability on the grounds that the market may be impeded is ridiculous and a very old strategy for misdirection. The flawed products that many software vendors market as an initial release would never fly in traditional industries. Fear of liability was much of the force that drove other industries to focus on rolling out a finished product that functioned correctly the first time. A little dose of fear would make vendors more cautious about rolling out beta versions of their products as 1.0 releases.

Brian Willson
Denver

Throttles included

I have one quibble with Kevin Tolly's column "Campus wireless poses bandwidth mgmt. dilemma" (www.nwfusion.com, DocFinder: 9527): The designers of the 802.11 protocol built in some throttles so no one station can use all 11M bit/sec as Tolly claims. Rather, one station (including the access point) is limited to about 7M bit/sec at best, meaning that large packets are used.

Other stations can use some remaining bandwidth, but still, the maximum aggregate bandwidth is less than 10M bit/sec.

John Burgess
Vice president, network design and engineering
Predictive Systems
Florham Park, N.J.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! www.nwfusion.com Find out what readers are saying about these and other topics. **DocFinder: 9525**

EXPO ENTRANCE
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PLEASE SHOW YOUR OFFICIAL BADGE
TODAY'S PANEL DISCUSSION ON DECLINING ATTENDANCE AT TRADE SHOWS HAS BEEN CANCELED
DUE TO INSUFFICIENT REGISTRATION

TOTALLY UNPLUGGED

Ira Brodsky

Use the 'Net to reform education

Over the past decade our K-12 education system has de-emphasized liberal arts in favor of preparing young people for the workplace. And with good reason: Competition for jobs is intense, most of today's jobs are highly specialized, and parents and employers demand quantifiable results.

We have made a big mistake. Young people need a solid liberal arts education now more than ever. Most of what schools offer for career preparation would be better served over the Internet.

Too many of our young people enter the workforce knowing precious little about the world around them. The K-12 and undergraduate years offer most of us a once-in-a-lifetime chance to learn about topics such as geography, history, literature and philosophy. We learn these subjects best as full-time students in traditional classrooms.

The 'Net and e-learning technology are better suited to job training and career advancement needs. Today's professionals are expected to work long hours and travel on short notice. They don't always have time to attend classes, but they do have time to squeeze in learning here and there using technology designed for just that.

Networks allow us to deliver content and courses in new ways, changing how students and teachers interact. VPNs let education institutions create virtual campuses with whatever geographic reach is desired. VPNs let companies extend education to workers, business partners and resellers in the field.

That's not to say there aren't significant challenges. Virtual campuses require advanced security solutions to limit access to registered students and prevent unauthorized redistribution of learning content. Standards also are needed to permit different content, tests and management tools to be used on the same platform.

During tough economic times, companies need to work smarter. Businesses need to bring new employees up to speed and retrain existing employees quickly. Corporations are increasingly realizing that the Internet and extranets can be used to train customers and business partners, and inform investors, consultants and industry analysts. Thus, the same technology used to train a new hire can be used to update an expert or persuade someone to make an investment.

There are exceptions: Hands-on training still requires a classroom and live instructor. But e-learning solutions can be used to prepare students to get the most out of such classes and to reinforce key lessons afterwards. 'Net-based e-learning won't replace job-related classroom learning as much as it will add to it.

Many educators are fond of saying they are preparing young people to be "lifelong learners." The best way to realize this noble goal is not to press teenagers to make boardroom presentations and focus on the bottom line. The decisionmakers of tomorrow will be the students who first learn the big picture.

Brodsky is president of Datacomm Research in Chesterfield, Mo. He can be reached at ibrodsky@datacommresearch.com.

Most of what schools offer for career preparation would be better served over the Internet.

YANKEE INGENUITY

Howard Anderson

What surviving carriers want

When Bernie Ebbers bowed out of WorldCom, there was surprise within the telecom industry — founding fathers of multibillion-dollar companies usually exit to drum rolls and blaring trumpets, not muted taps. But the implications of Ebbers' demise are more far-reaching than whether WorldCom's new leader can make a go of it. One previously strong carrier has joined the ranks of the walking wounded — and another (Qwest) may soon follow.

For the past two months, Tim Kraskey, my partner at YankeeTek, and I have been visiting the Carriers Still Standing (CSS) to learn which technologies they do and do not plan to buy. This used to be a terrific game. We venture capitalists would ask which type of technology was desperately needed. We would count on the fact that the traditional equipment vendors would be late with that product and would start a company to build the product first. If we were right, the win was worth billions of dollars.

But now, Game Over, Start New Game. Cisco no longer is worth $555 billion, Nortel is bleeding red ink, and Lucent keeps restating its financial position.

So this is what Tim and I heard on our wonderful road trip: First, the CSSes don't even want to think about new network products that have a return on investment greater than one year. They want products that will either save them that much right away or generate that much additional profit.

Second, these carriers only want technology that migrates to packet infrastructures — that means a rapid migration from circuit to packet voice, softswitching and Gigabit Ethernet. They will not make any additional investment in analog technologies or new voice circuit switches. Also, they won't buy any technology that can't be leveraged and won't scale.

What is scary is that the internal evaluation teams at these well-heeled carriers have been decimated. It used to be that if you had world-class technology, there was a crack telephone company crew that would conduct the testing and evaluation, and be your godfather inside the carrier. No more. All these tiger teams have been reassigned or downsized. One CSS told us that it didn't think it would be able to evaluate today a firm as potent as Cascade was in its time. This is bad news for upstart telecom suppliers.

Third, these carriers want to migrate SONET to OC-192 (Multi-Service Provisioning Platform). Those who think SONET is dead don't know what they are talking about. What the CSSes want is migration from old-style SONET framing to the new, improved version, which means SONET that can carry Ethernet or packet-based traffic.

These guys are down on Class 5 replacements in the packet world and very-high bit rate DSL. They see themselves moving to a packet tandem replacement for the current Class 4 architectures. What they are high on: optical all over the network, softswitching for packet tandem replacement and local packet technology. They still are entranced with the idea that they could provide a residential product — a "God" box that would do modems, home gateways, security and home video. They, like us, are intrigued by 802.11, WiFi and voice over IP.

Bottom line: The CSSes are the only buyers left with money. They want to take as little risk as possible, and they want products from vendors that will still be in business next year. The age of OEM is returning because the previous carrier technology buyers are flat broke and their stock price is in the sewer. Therein lies the answer if you are an upstart — plan on packaging your box into a trusted equipment supplier's product, but don't count on them making you rich overnight. On the other hand, these trusted third parties now realize that they can't afford to either build all the products themselves or to buy them. And shed a tear for Ebbers — he counted on an infinite supply of cheap money and a stock price that was at least in double digits.

Anderson is senior managing director of YankeeTek Ventures, a Cambridge, Mass., venture capital fund for early-stage technology companies. He is also founder of The Yankee Group and the William Porter Distinguished Lecturer at the Massachusetts Institute of Technology. He can be reached at handerson@yankeetek.com.

But the implications of Ebbers' demise are more far-reaching than whether WorldCom's new leader can make a go of it.

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Web optimization options

From load balancers to client caching, pick the proper product to fix specific performance problems.

■ BY THOMAS A. POWELL, NETWORK WORLD GLOBAL TEST ALLIANCE

When Web site delivery is no longer fast and furious, but more slow and spurious, visitors might quickly click to the competition. The challenge for Web managers is to provide speedy, robust Web services to a growing audience, often using fewer resources.

We surveyed the range of current Web acceleration approaches from first look-up to last mile, looking for real network speed without the hype. What follows is a guide to some of the products you should consider for solving specific performance problems.

Starting strong

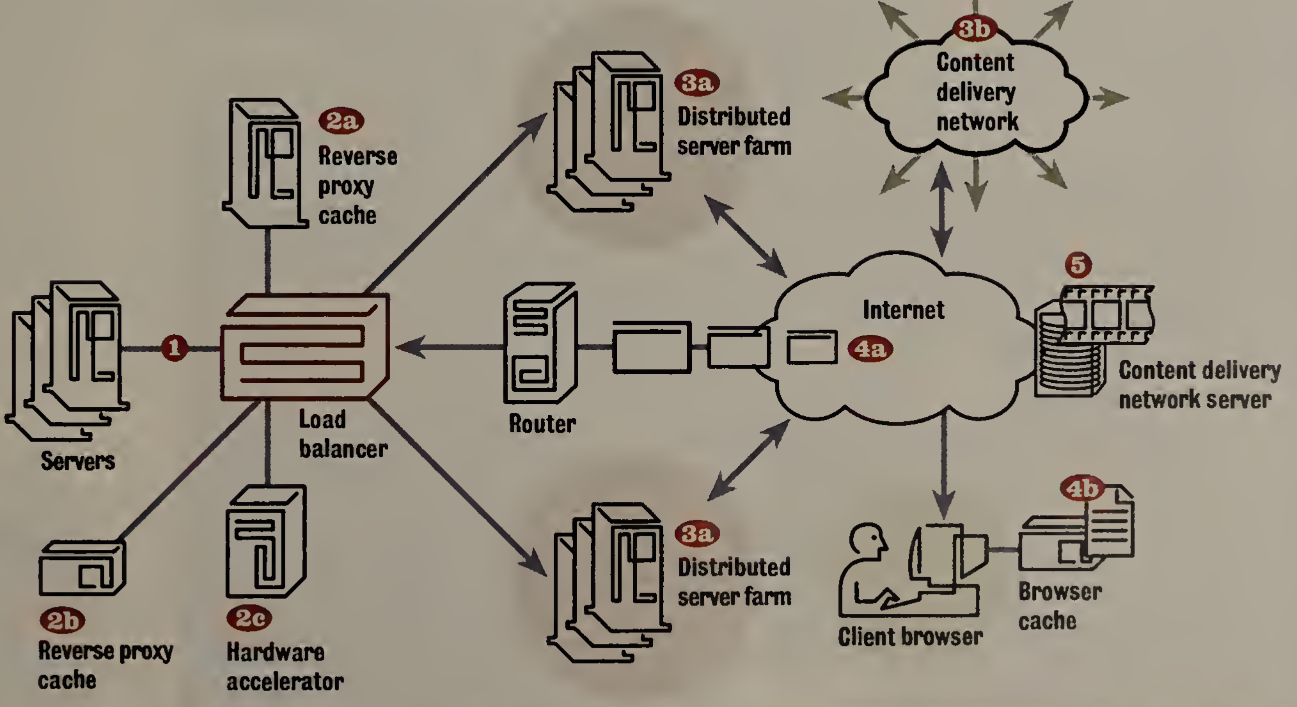
The race is on from the first DNS query. Does your name server reverse the address quickly? Fail here and it's all over, so stop putting DNS on the oldest server in the farm and treat it as the critical service it is. To address volume look-up concerns and geographical diversity, and improve overall name service reliability, consider outsourcing at least your back-up DNS to a vendor such as UltraDNS or Nominum. Finally, you also can use DNS for global load balancing by directing initial requests to the closest server or farm.

Stop a slowdown

Once the request is on its way to a server, the real slowdown begins. The causes run the gamut from connections being held open by slow dial-up visitors to sudden flash crowds to excessive page-generation time or underpowered Web farms. These problems fall into two broad areas: page compute-related issues, and network and protocol effects.

Performance enhancements

Try these tips for speeding up your Web site.



❶ As site traffic increases and your server becomes overwhelmed, add a load balancer and build out a server farm.

❷ To keep servers from working too hard, try one or all of these methods:
a. Pregenerate your frequently accessed pages if they are built from a database.
b. Add a reverse proxy cache or cache appliance to serve content.
c. Add hardware accelerators to free up servers from handling inbound requests.

❸ When addressing a large load across a widespread geographical area:
a. Build a few server farms and globally load balance between them.
b. Use a content-delivery network source.

❹ To reduce bandwidth requirements:
a. Compress your responses.
b. Author Web pages to be cache-aware and take particular advantage of local browser caches.

❺ When dealing with delivery-sensitive data such as video, move close to the user and deliver from the edge of the network.

Computewise, page-generation time can be excessive. When using any Web technology from Active Server Pages to Zope, build it only when necessary. Executing scripts or running database queries to fetch page components for each visitor makes no sense unless there is variation in what each sees. Software caches such as SpiderCache can be used to hold pregenerated pages. Hardware caches such as those from CacheFlow can even help offload the server from the request.

Yet neither acceleration approach works well for truly dynamic content. So-called dynamic caches such as Chutney Technologies' PreLoader can be used to hold portions of pages. But performance gains for dynamic sites are often hard won, so you're better served trying other Web site acceleration techniques first.

When you get to the network, speed problems run deep. It's well known that HTTP and TCP congestion-avoidance algorithms don't work well together. Moreover, Web servers are busy serving numerous small requests and often become network I/O bound, holding connections open for slow downloads.

A simple remedy is to avoid wasteful connections to a server. Don't bother to force your server to hand out needless "304 responses" indicating items haven't changed. Make your site cache-friendly and set expiration dates far in the future for elements that don't change, such as navigation graphics.

Another possibility is to offload your server by having another device — often dubbed an accelerator — receive connections. Effectively a connection multiplexer, such devices manage and maintain all TCP connections with clients, minimizing the number of requests a server receives. Several vendors employ such connection pooling ideas in their accelerators, the most impressive being Redline Networks.

Lighten the load

The amount of content being delivered can also reduce speed. Deliver a smaller payload and you not only save bandwidth, but also you free up your servers to accommodate more users. Binary

Avoid wasteful connections to a server.

data such as images and flash content can hog a lot of space, so question the value of every image, rollover effect or multimedia element before including it. You'll find many popular sites adopting extremely lightweight designs.

With the system pared down to the essentials, the site administrator is now faced with how to deliver what's left. The first task is to consider compression. Web image-compression techniques such as color reduction, thought to be out of vogue given the lack of low-resolution users, still make sense. Further text reduction comes from removing white space in HTML, JavaScript and CSS files.

Many servers such as Internet Information Server support HTTP compression natively, although server add-ons such as BPVN Technologies' PipeBoost improve on basic compression offerings. High-traffic sites such as Google selectively compress HTML content, depending on the type of browser the user has, for huge aggregate savings in bandwidth. But be careful before rushing to simple HTTP compression, as bugs exist even in popular browsers such as Internet Explorer.

Diminish distance

The issue of latency arises when content is sent to end users. Serving content as close to the edge of the Internet as possible using a content delivery network (CDN) such as Akamai makes sense. But CDNs tend to be expensive and suffer from the same problems as caches when it comes to dynamic content. The Edge Side Includes markup language aims to make it easier to develop Web content that can be dynamically assembled at the edge of the network.

For truly exotic acceleration, you must use acceleration that works not only on the server or network, but also on the client side. For example, FineGround's Condenser takes advantage of the fact that many Web pages are very similar. Condenser tries to deliver only the "deltas," or differences between pages, and reassemble them client-side using JavaScript. It may sound unusual, but it actually works pretty well. And FireClick's NetFlame2 takes a unique approach by using JavaScript object prefetching combined with site-usage analytics to predictively precache the most likely next-requested content during the time a user is looking at a page.

Many products attempt to combine Web acceleration approaches and address caching, compression and connection multiplexing with Secure Sockets Layer acceleration or CDN integration thrown in. Vendors such as Netscaler, Packeteer and Redline offer popular acceleration gear that pays for itself with simple bandwidth reduction and hardware savings.

Yet before speeding up your site, make sure it's built properly and that it strikes a balance between delivery demands and customer experience. Otherwise, you'll go nowhere very fast.

Powell is president of PINT (www.pint.com), a Web services firm, and the author of numerous books on Web development practices. He can be reached at tpowell@pint.com.

Global Test Alliance

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Network Computing EDITOR'S CHOICE

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Smart routes

New products, services go beyond BGP to offer improved Internet routing.

■ BY JAMES COPE

Freemarkets.com was conducting an international business-to-business auction last fall when an important bidder in Australia simply logged off because network latency had reached several minutes.

As a result of that and similar experiences, John Benzinger, vice president of IT and product development at the Internet auction service provider, implemented PathControl, an intelligent routing device from RouteScience Technologies.

The Australian customer's problem quickly went away, Benzinger says. Reports generated by PathControl showed that a congestion point on a Tier 1 backbone somewhere in Asia was causing the problem, and the RouteScience device shifted traffic to a Tier 2 provider that skirted around the traffic jam. Web page download time dropped from unavailable to around 4 seconds.

Congestion issues such as the one experienced by Freemarkets.com are a function of the limitations of Border Gateway Protocol (BGP), used by routers on the Internet to direct traffic. BGP, Benzinger says, looks for the nearest router hop, and doesn't distinguish between connection points that have a light traffic load and those where packets are waiting in the queue.

RouteScience is one of several companies introducing products and services aimed at using smart routing or intelligent routing technology to pick the best route on the fly for customers with two or more ISPs.

There's no place like multihome

The first step toward route nirvana is multihoming, or purchasing Internet connections from more than one vendor. For example, UAL Loyalty Services, a unit of United Airlines in Schaumburg, Ill., is now connecting two data centers — a primary and a back-up — through multihomed services provided by Internap Network Services (see story, page 50).

Igor Rafalovsky, director of networking and security for UAL, says two DS-3 links, one for each UAL data center, connect to two Internap junction points that in turn connect to multiple backbone providers. Rafalovsky says that approach provides an elegant disaster-recovery scheme while minimizing the number of router hops users around the world have to take to tap into content on the UAL servers.

The next step would be to add smart routing. Rafalovsky says he's in discussions with Internap to add exactly those services, so UAL could distribute traffic between data centers based on source and destination addresses.

Intelligent routing appeals to Adam Joffe, vice president of IT for Sony Online Entertainment. He's been testing Flow Control Platform (FCP), an intelligent routing technology from netVmg, to even out the user experience of its online action game Tanarus across four Tier 1 service providers.

The number of gamers online at any given time varies widely, Joffe says. It can burst from just a few thousand during the week up to 95,000 simultaneous gamers on weekends. Joffe stresses his reason for trying the netVmg technology "is about stabilizing performance, not improving it."

He says, aside from some scaling problems, which Sony and netVmg are working on, "their software has worked as advertised and is making several thousand changes [selecting routes across multiple service providers] for us a day." Savings on bandwidth varies, but can be significant, ranging between 20% and 40%, compared with manually analyzing network performance and shifting the load between ISPs, Joffe says.

Same goal; different approaches

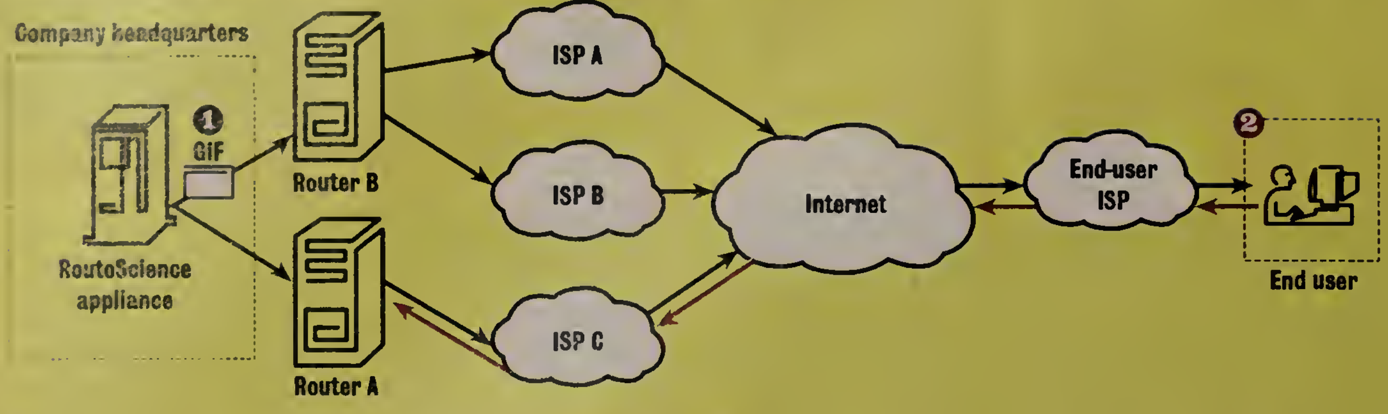
- RouteScience's PathControl determines the best route among multiple service providers by reading latency and packet loss of a one-pixel GIF file sent out over multiple service provider links to user endpoints. The GIF generally resides on a home page or a site logon page. Every time that page is accessed, PathControl forces the GIF image to be routed across both active links, the ISP link chosen by BGP, and inactive links (ISP links ignored by BGP) to determine optimum routes.

In addition to sending out the GIF to measure performance on unknown endpoints, RouteScience's product also uses an active TCP probe to determine the best route to known endpoints — a remote office that communicates with headquar-

ILLUSTRATIONS MICHELLE BARBERA

Two approaches to smart routing

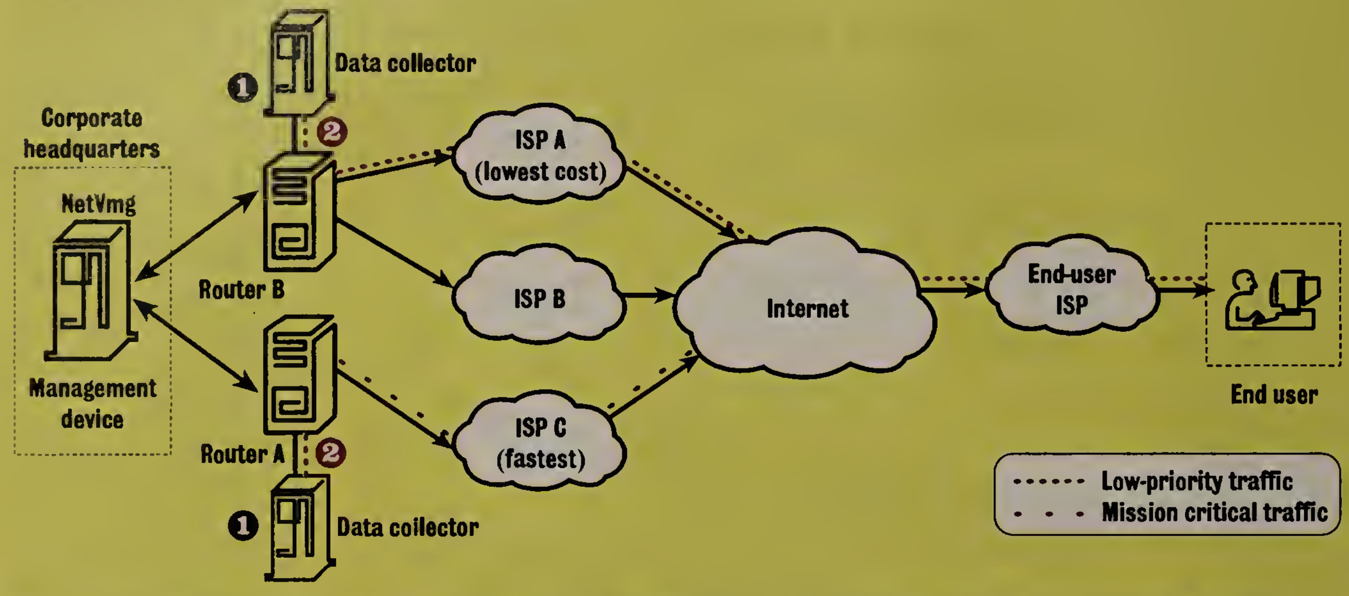
RouteScience uses one-pixel GIFs to measure network latency.



① When a user requests a Web page, the smart routing appliance sends the GIF file to measure performance of all ISPs.

② The RouteScience appliance analyzes network statistics and selects the best route, not necessarily the shortest route.

NetVmg monitors actual Web traffic to determine best route.



① Data collectors monitor traffic for packet loss, latency and jitter.

② Data collectors send information to a management device that routes traffic based on policies. Low-priority applications can be sent along the lowest cost routes, high-priority traffic could get special routing along the fastest route, regardless of cost.

ters over a VPN, for example. The enterprise network manager specifies the known endpoints to be probed and the frequency of probing. "It would not be unreasonable to ping an enterprise's remote locations every second, so that real-time applications such as [voice over IP] can operate over constantly optimized IP-based connectivity," says RouteScience Vice President Andy Gottlieb. PathControl can cost up to $250,000.

- NetVmg's FCP takes a different approach to best-path measurement. "We look at actual traffic, measuring the actual traffic to determine packet loss, latency and jitter. Then, we weed out healthy traffic from sick traffic and look for alternative paths for the sick traffic," says netVmg's Senior Vice President Eric Wolford, noting the FCP software running on a Linux box examines network flow through a mirrored port. Wolford adds that his company's technology monitors all IP-based traffic, including Sony's online gaming sessions that employ User Datagram Protocol (UDP).

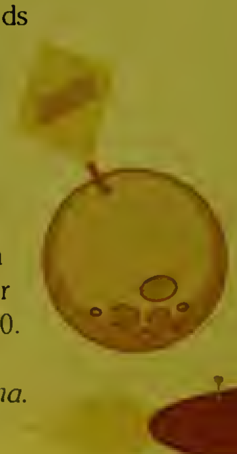
The netVmg measurements from each link create a performance baseline. Network managers can then set policies for specific applications or classes of traffic, either by latency tolerance in milliseconds or by a standard deviation as a percentage from the mean of the baseline. FCP also costs up to $250,000, depending on the number of ports and bandwidth requirements.

- Radware in Tel Aviv also has moved into intelligent routing with its PeerDirector product. PeerDirector, like PathControl and FCP, works with BGP routers probing a multihomed network for the best path.

- Two other start-ups, Network Physics and Opnix, are working on intelligent routing technologies. Yahoo has tested Network Physics' NP-1000, which according to Mike Bennett, director of engineering for Yahoo's financial services group, shows promise in detecting choke points on the Internet and displaying the information via a graphical user interface. It uses algorithms based on chaos theory that the developers say can detect patterns in the mass of packets that make up the Internet. Bennett says the device, which costs between $25,000 and $90,000, gives network managers the information they need to manually route around the congestion points.

Network Physics says later this year the company will introduce a flow-control device that will automatically optimize net flow using the NP-1000 analytics.

Opnix's vice president of sales and marketing, Rajeev Arora, says the company's intelligent routing system consists of a $20,000 customer-premises box called the Orbit 1000 that sits next to a BGP router and sends out active probes to the multihomed ISPs to measure performance. That data is sent to a central route optimization engine managed by Opnix. Every 30 minutes, the route optimization engine updates the Orbit with best-path information. The optimization engine sells for $1,000 per month as a service, and can also be purchased for on-premises installation starting at $100,000.



Cope is a freelance writer living in Indiana. He can be reached at jc@jamescope.com.

Smart routing as a service

Gartner analyst Ted Chamberlin says intelligent routing could find a home as a service than as something hardwired into corporations. Examples are Internap Network Services, Sockeye Networks and International service provider Equant, which now offers intelligent routing across multiple ISPs as a service.

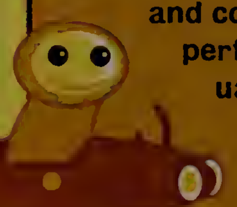
Internap and Sockeye employ proprietary intelligent routing technologies, while Equant uses netVmg's system.

McAfee.com in Sunnyvale, Calif., is an Internap customer. The antivirus company's CIO, Doug Cavit, says having one service provider that connects to a raft of the backbone providers mitigates risks of network outage and slowdowns. "Users come from all directions to get antivirus updates," Cavit says, "just because Sprint is having a bad day doesn't mean McAfee is having a bad day."

Internap uses what product manager Gene Lomas describes as "an active probing technique that gathers ISP performance data based on customer traffic and then optimizes performance-based thresholds specified in the customer service-level agreement [SLA]."

Sockeye, which provides intelligent routing services directly to companies and also through service providers such as Focal Communications, gets its network congestion information by sending out probes. It also gets information from Akamai's content delivery network to discover congestion and route around it.

In addition to circumventing a capital outlay, another benefit of using these services is they offer one SLA. Internap even provides an online portal detailing performance of the multihomed service and comparing that to the performance of the individual ISPs.



— James Cope

NetworkWorld Review

NetQoS's SuperAgent 2.0

Change the way you diagnose performance problems

■ BY BOB CURRIER, NETWORK WORLD GLOBAL TEST ALLIANCE

Diagnosing difficult network and application-layer problems is often an exercise in frustration and finger-pointing. The network staff is certain the packets are flowing fine. The database administrators swear Oracle is crunching out thousands of transactions per second. And the server team says they're only seeing a 10% CPU load. But the help desk phones are ringing, and users are getting perturbed. Sound familiar? Wish it didn't? Then take a look at NetQoS's SuperAgent 2.0.

NetQoS provides network and enterprise application managers with a powerful tool to pinpoint problems. Put SuperAgent on the case, and you can forget about the finger-pointing.

NetQoS's SuperAgent 2.0 is a network and application response-time analyzer that's completely passive — no endpoints, server applets or Internet Control Messaging Protocol (ICMP) ping packets needed. In fact, SuperAgent doesn't put any additional traffic on the network. Based on a Dell PowerEdge server and Windows 2000, SuperAgent uses sophisticated statistical analysis techniques to gather end-to-end performance numbers on any TCP-based application. Results are stored in a SQL database and displayed via a Web-based interface. Reports and alarms are delivered by e-mail or through an existing management system. SuperAgent is available in two models: a stand-alone probe, which we tested, and a multiunit configuration that aggregates the data collection and reports functionality from multiple collectors.

Targeted at the enterprise, SuperAgent lands squarely in the gray area between a full-blown protocol analyzer and an active application measurement package with client-side agents and server applets. Other products, such as Mercury Interactive's Topaz, provide some of the same features, but SuperAgent is unique in its passive approach to TCP-based network and application analysis.

On the case

We deployed SuperAgent in a harsh environment — our enterprise server network. Our bandwidth utilization averages 55M bit/sec and the applications on this network segment are critical to our daily operations: SAP R/3, PeopleSoft, our e-mail server farm, Web server farm and primary FTP site.

Initial setup of SuperAgent is straightforward and a "first-time setup" wizard is provided to simplify the process. To begin data collection and reporting, several configuration parameters need to be defined. NetQoS uses the concept of Client Regions to distinguish between different user groups. A client region is a range of IP addresses and can be configured as a Class A, B, C or D network.

We configured SuperAgent to use our two Class B network addresses: 152.3.0.0 and 152.16.0.0. A word of warning: We discovered that using global addresses such as our two Class Bs, while simplifying the initial setup process, made later configuration more complex. Once we told SuperAgent that our client regions were 152.3.0.0 and 152.16.0.0, the application would not let us go back and define a subnet contained within these Class B networks. To identify 152.3.2.0 as the "Marketing" client region we had to delete the global definitions. Network administrators with responsibility for a range of addresses might find this cumbersome. We would prefer to define global regions while retaining the ability to specify individual subnets as unique client areas.

After connecting SuperAgent to a mirrored port and verifying network connectivity, we used the autodiscover feature to analyze the traffic flowing across our network. Autodiscover looks at the TCP port numbers and builds a table of servers and applications. The autodiscover process was very useful and saved us from having to manually configure each application and server that we wished to monitor. Unfortunately, the current release of SuperAgent does not perform reverse DNS lookups, so IP address and not domain name identified the servers. We found this to be inconvenient, particularly when several servers are grouped under the same domain name in a server farm. NetQoS officials said reverse DNS functionality will be provided in release 3.0, due out late this summer.

Rapid reports

SuperAgent provides users with a wealth of information. The graphs generated by SuperAgent were very useful — detailed, easy to read and to the point. The amount of statistics collected by SuperAgent is enormous, and NetQoS gets high marks for not burdening network executives with information overload. Each graph contains just the right amount of detail. If an in-depth look at data is desired, detailed descriptions are only a click away.

Graphs available include:

- Response Time Summary: The time elapsed from when a client requests data to receipt of the last packet in the response.
- Traffic: Reports on the volume of bytes, packets, bit and packet rates.
- Sessions: Session count, refused session count and session times.
- Components: Connection set-up time, server response time, data transfer, retransmission delay and network round-trip time.
- Quality of service: Rate per user, number and IP address of users and loss statistics.
- Trends: Daily, weekly and monthly.

We were particularly impressed by SuperAgent's ability to calculate network round-trip time (RTT) without using ICMP ping packets. SuperAgent does this by taking advantage of the sequence numbers used in TCP sessions. The first sequence number is noted and time-stamped, and each subsequent response from the server is recorded. Network round-trip time is calculated by using the difference between the time stamp of the first client request and the subsequent acknowledgement packet from the server. Application response time is not a factor. We verified the validity of SuperAgent's RTT calculations by running a parallel ping process and comparing the results.

The graphs are available through the Web-based interface, or they can be sent to users via e-mail. We encountered two problems with the e-mail delivery of the graphs. The most serious problem was related to the lack of reverse DNS lookups.

■ Net Results

SuperAgent 2.0

4.25
RATING

Company: NetQos, (877) 835-9575, www.netqos.com **Cost:** $28,500 for stand-alone probe; $45,000 for management console and $9,500 for each collector. **Pros:** Easy to install; superb statistics; rock-solid reliability; great documentation; excellent reporting facilities. **Cons:** Limited to PRG image format; does not do reverse DNS lookups.

What's the score?	SuperAgent
Features 40%	4
Ease of use 35%	4
Reliability 10%	5
Installation 10%	5
Documentation 5%	5
TOTAL SCORE	4.25

Individual category scores are based on a scale of 1 to 5. **Percentages** are the weight given each category in determining the total score. ■ **Scoring Key: 5:** Exceptional showing in this category. Defines the standard of excellence. **4:** Very good showing. Although there may be room for improvement, this product was much better than the average. **3:** Average showing in this category. Product was neither especially good nor exceptionally bad. **2:** Below average. Lacked some features or lower performance than other products or than expected. **1:** Consistently subpar, or lacking features being reviewed.

The reports from the SuperAgent probe were e-mailed with a return address of SuperAgent@152.3.x.x instead of SuperAgent@netqos.netcom.duke.edu. Because our e-mail systems reject all mail from unknown domains, the reports were never received. NetQoS responded immediately to our request for help and made a patch available on its Web site within 24 hours. We installed the patch, and the problem was resolved.

Our second problem was that Lotus Notes doesn't provide support for the PRG graphic format used by SuperAgent. NetQoS said JPG support would be provided in the next release.

Installation and documentation

SuperAgent 2.0 comes preinstalled on a Dell PowerEdge server running Win 2000. Installation is straightforward. Simply locate SuperAgent as close as possible to the servers being monitored and enable port mirroring on the probe's Ethernet connection. That's it — with a Web-based interface there's no client application to install.

The documentation for SuperAgent 2.0 is top-notch. Hyperlinks on the SuperAgent home page provide ready access to NetQoS's frequently asked questions, release notes, downloads and documentation. Two printed manuals are supplied: a concise SuperAgent user's guide and a comprehensive SuperAgent administrator's guide. We found both to be excellent.

SuperAgent 2.0's combination of functionality, reliability and superb reports make it a definite "must have."

Currier is the ECI Director of Data and Telecommunications at Duke University in Durham, N.C., and the 1998 Grand Prize winner in the Excellence in Campus Networking competition sponsored by CAUSE, a user group for computer professionals in higher education. He can be reached at robert.currier@duke.edu.

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How we did it

We installed the SuperAgent 2.0 probe on our enterprise application network segment. The probe's Ethernet adapter was connected to a mirrored port on the Cisco 3548 that handles all traffic destined for our SAP R/3, PeopleSoft, e-mail, FTP and Web servers. Bandwidth utilization on this segment averages 55M bit/sec.

We let SuperAgent collect data for two weeks to test reliability, functionality and e-mail notification. The probe maintained a consistent response time during the evaluation process despite rapidly increasing growth in the database and never crashed during our test period.

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SUPERCOMM

Network World's SUPERCOMM 2002 PLANNING GUIDE

SuperComm convenes June 2-6 in Atlanta after a year that brought big changes to the telecom industry, including the bankruptcy of many promising new providers and a decline in carrier infrastructure spending.

With those facts as a backdrop, this year, SuperComm has removed the fee for its Enterprise Networking and Services Conference (EntNet) designed to educate network professionals about key network technologies. Focusing on the convergence of voice and data networks, EntNet includes a variety of formats for discussion, from tutorials to panel discussions to debates.

Sessions such as "The Future of the Internet, Is It Falling Apart?" and "How Convergence Affects My Services, If At All," tie in new technology with business needs. Other sessions such as "Is Your Health Anybody Else's Business?" deal with the human impact of networked data. These sessions are scheduled during Monday and Tuesday, leaving time Wednesday and Thursday for you to visit technology suppliers and service provider exhibits on the show floor.

To break the wealth of information available at the show into manageable chunks, the educational portion of SuperComm is divided into six technical forums that focus on technology from softswitches to Multi-protocol Label Switching and services ranging from passive optical networking to Wi-Fi. SuperComm also features keynotes from industry leaders that will help you understand their vision of where network-based services are headed.

You can get hands-on experience at workshops and by visiting the vendors and service providers booths.

More than 800 exhibitors will display their wares on the show floor at the World Congress Center for attendees to browse when they are not attending one of the nearly 200 educational sessions.

To help you separate the wheat from the chaff, we've highlighted a number of sessions and events you should check out.

Monday June 3

8:15 to 9:15 a.m.

Meeting Future Challenges of Large Enterprise Networks

How will people running large enterprise networks deal with the need to support more interactive applications and to merge their voice and data networks? This session brings together the top network planners for two major U.S. corporations and one of the industry's foremost network consulting executives to discuss strategies for meeting corporate demands and the technology that can help them reach their goals. Steve Heidt, president of Electronic Data Systems' distributed system services, will lead this group that includes Kenneth Lacy, CIO of United Parcel Service, and Anthony Scott, CTO of information systems and services for General Motors.

10 to 11:30 a.m.

Enterprise Service & Network Solutions

Service providers are trying to figure out what new services they can provide that will be useful to the people who run enterprise networks. This session will include discussions of managed IP VPNs, service-level agreements for these services, Web-based conferencing and converged corporate voice/data networks, and how they save money and improve productivity. This session is chaired by Rob Mechaley, chairman of RadioFrame Networks and former chief scientist for McCaw. Panelists include Dennis Bouffard, a product line manager with AcceLight Networks and former director of Nortel's e-Business Optical Services Management; Kundan Misra, an analyst with Clarity International; and Marlene Williamson, vice president of marketing at PlaceWare.

PICK OF THE DAY

MONDAY 11:30 a.m. to 1 p.m.

Why Wi-Fi? Wireless LANs for the Enterprise and Beyond

802.11b wireless LANs offer attractive features if security concerns can be addressed. This session brings together experts in the area to talk about how they will address better management of access to wireless LANs, managing VPNs over wireless connections and making it simpler to manage the access points that tie roaming users to wired resources. Donald Fye of Fye Associates will chair the session of panelists: Robyn Aber, senior director of solutions development, engineering and marketing, Cisco; Eugene Chang, vice president of business development, Funk Software; Pierre Trudeau, president, Colubris Networks; and Allan Rubin, manager of network engineering, Delta Airlines.

1 to 2:30 p.m.

Metro-Area Optical Networks

What would a corporation do with its own wavelength of capacity across a metropolitan network? Find out at this session where the latest metropolitan optical technology will be discussed with an eye toward turning simple high-bandwidth transport into intelligent services. The speakers will cover issues including ways to channelize wavelengths to provide high-bandwidth links and transporting storage-area network traffic in its native state across metropolitan optical links. Chairman Hagay Katz, founder of PacketLights Networks, will lead panelists: Jesús León, senior vice president of metropolitan transport at Ciena; Jane Li, vice president of marketing at Novalux; and Michael Piacenza, vice president of business development at Essex.

Tuesday June 4

9 to 10:30 a.m.

Enterprise Security: Will the Next-Generation Applications Really Be Secure?

Instant messaging and short message services are tools corporations can use to be more productive, but they post new threats to corporate network security. As network executives try to shore up these new weak spots, they have to balance the demands of network privacy and personal privacy. This session brings together a variety of security experts [illegible] developing new corporate security plans. [illegible]ley Hicks, CTO of Sonus Networks, [illegible] includes: Steve Bakke, CTO of [illegible]ton, executive vice president [illegible]

[illegible] Phillips, president of [illegible] and [illegible]wealt, senior director [illegible]es.

10:45 a.m. to 12:15 p.m.

Real World SLAs for Real World Networks: Managing QoS Across Multiple Broadband Access

As businesses buy more bandwidth, they want to assure that they receive the levels of service they need. To do so requires that service providers offer service-level agreements that include guaranteed quality of service. This panel will present technologies that enable these guarantees including SLAs for Gigabit Ethernet, quality of service in Ethernet metropolitan networks and how to maintain SLAs in access, metropolitan and long-haul networks. The chairman of this session is Avinoam Rubinstain, CTO of Atrica and the panelists are: Pierre Lin, vice president of network architecture for Yipes Communications; Pascal Menezes, CTO of TeraBeam; and Sten Norell, CTO of Utfors.

Wednesday June 5

8:15 to 9 a.m.

Keynote: John Chambers, CEO, Cisco

As the head of perhaps the most influential networking company, John Chambers shares his view of the new services that next-generation packet networks will spawn and how they can boost corporate efficiency and service provider profit. "As service providers create the next 'wave' of services to attract new customers and generate additional revenue streams, they are also more focused than ever on using the network to reduce operating and capital expenses and enhance internal productivity," Chambers says.

11 a.m. to 12:30 p.m.

Next-Generation Access Networks: Service Integration at the Network Edge

Makers of packet-based switches that carry voice and data traffic promise attractive new services, but they are just starting to be rolled out in limited areas. Businesses that want to know how these new networks function and what the status is of them being deployed can get the answers they are looking for at this session. The chairman of this panel, Donald McCullough, vice president of product line management for Advanced Fiber Communication, will lead discussions of what switching

☛ PICK OF THE DAY

Wednesday, 9:15 to 10:45 a.m.

First-Mile Face-off: A Roundtable

Corporations have many technology options to choose from when building access links to WAN services, but might need help navigating the newest possibilities. These options are not right for all situations, and this roundtable discussion will weigh the pros and cons of each. Technologies on the agenda are passive optical networks, free-space photonics, very-high bit rate DSL and broadband wireless. Steve Grady, regional marketing officer for Marconi, will host this session that will include speakers Bart Alvarez, director of Paceon; Kuldop Bains, CEO Kenetec; Scott Rafe, CEO of Digital Atlantic; and Alastair Westgarth, CEO of Navini Networks.

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options are available, how these networks are likely to evolve and the implications of converting from circuit to packet networks. Panelists are Mark Kenyon, assistant vice president, evolution planning and systems at Sprint; Michael Cooney, manager of product line management at Advanced Fiber Communications; and Scott Weidenfeller, vice president of product management and marketing for Santera.

2:15 to 12:30 p.m.

Future of Messaging

Instant messaging has made an impact on networks and not far behind are unified messaging and the use of these technologies over wireless networks. Carriers are figuring out how best to support and sell these services. This session will provide insight into their thinking, valuable knowledge for network executives. Chaired by Stephen Kenyon, assistant vice president of Comverse, the panel also includes: David Ross, director of business development for Internet services, Qualcomm; George Hallenbeck, CEO of Evolving Systems; and Jonathan Shoham, director of marketing for next generation services, Comverse.

☛ PICK OF THE DAY

Wednesday, 4 to 5 p.m.

Network World's Live Broadband Showdown

Businesses are looking for ways to extend their corporate networks to more sites via broadband, but are finding it difficult to get the broadband connections they need, particularly to their small branch office or employees' home offices. In this presidential-style debate hosted by *Network World* President and Editorial Director John Gallant, representatives of leading broadband providers will field questions from Gallant, each other and the audience. Amy Harris, program director for broadband markets and technologies with IDC will also question participants.

Panelists include Joe Brooks, vice president of sales and marketing development, WorldCom; Kevin Casey, executive vice president of operations for AT&T Broadband; Peter Gulla, vice president consumer sales and marketing, DIRECWAY; and Chris Rice, senior vice president of network planning and engineering, SBC Communications.

Thursday June 6

8 to 9:30 a.m.

Industry Technology Directions: An Analyst View

Most people have their heads down focused on their day-to-day problems and lack the time to get the broad picture of where technology is taking them. This panel seeks to provide a broader perspective on emerging technologies as vendors implement them. Panelists include John Ryan, chief analyst, RHK; Joseph Baylock, group vice president, Gartner; Beth Gage, vice president of consulting, TeleChoice; Peter Jarich, director global broadband research, Strategis; and Robert Rich, executive vice president of research and consulting, The Yankee Group.

9:15 a.m. to 5 p.m.

Options for Broadband Access

Voice, video and data can be carried over a single access line with the potential to save on costs and management, but also to offer new services. The instructors include Lowell Lamb, director of PON networks for Terawave; Rashmi Doshi, CTO, Everest Broadband; Greg Langdon, executive vice president of product strategy for Siemens; Derek Underwood, director of product management for access solutions, Siemens; Robert Lund, CTO of Optical Solutions; Yural Mor, a manager of product marketing at Cisco.

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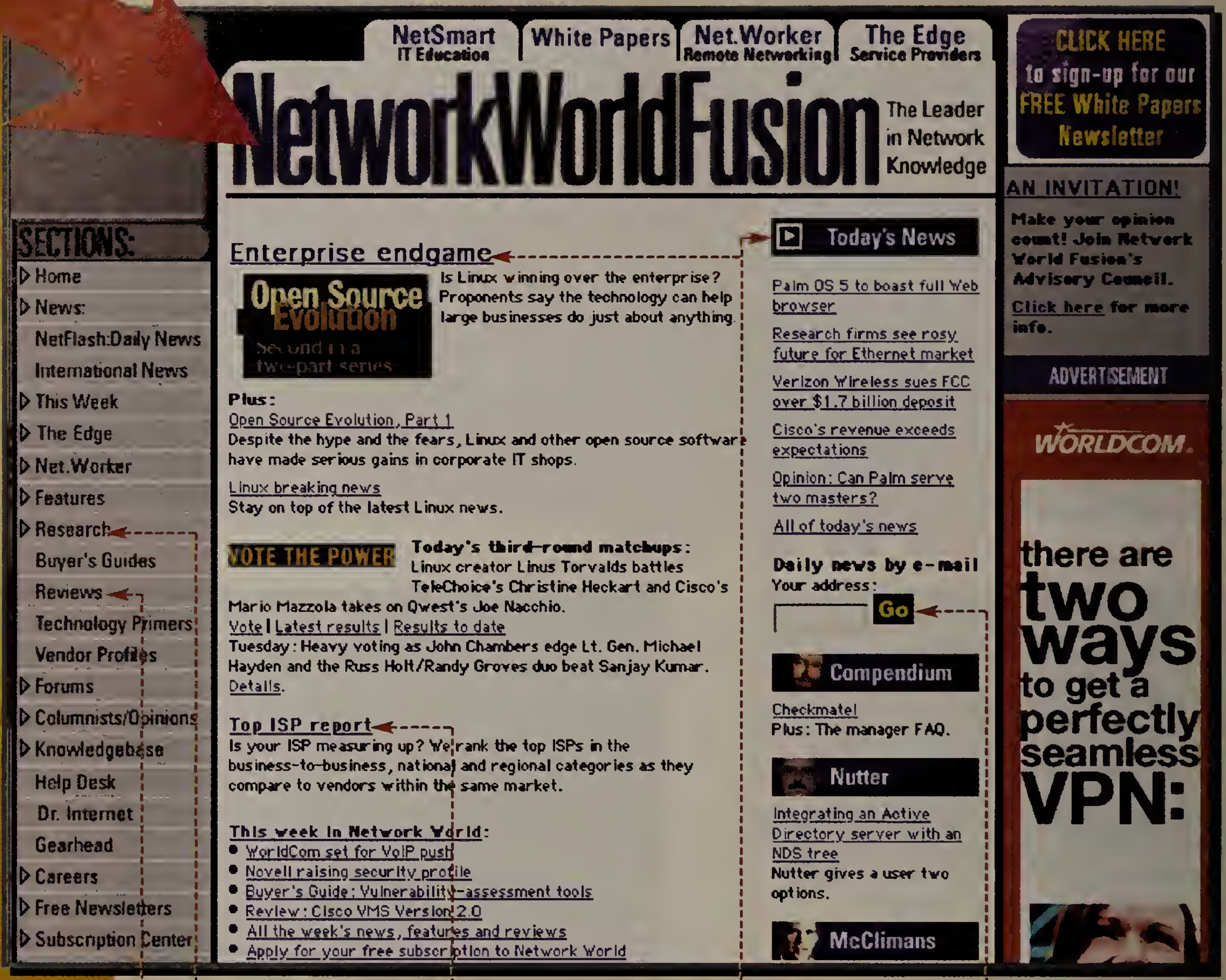
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Enterprise endgame

Open Source Evolution
Second in a two-part series

Is Linux winning over the enterprise? Proponents say the technology can help large businesses do just about anything.

Plus:
Open Source Evolution, Part 1
Despite the hype and the fears, Linux and other open source software have made serious gains in corporate IT shops.

Linux breaking news
Stay on top of the latest Linux news.

VOTE THE POWER

Today's third-round matchups:
Linux creator Linus Torvalds battles TeleChoice's Christine Heckart and Cisco's Mario Mazzola takes on Qwest's Joe Nacchio.
Vote | Latest results | Results to date
Tuesday: Heavy voting as John Chambers edge Lt. Gen. Michael Hayden and the Russ Holt/Randy Groves duo beat Sanjay Kumar. Details.

Top ISP report
Is your ISP measuring up? We rank the top ISPs in the business-to-business, national and regional categories as they compare to vendors within the same market.

This week in Network World:
- WorldCom set for VoIP push
- Novell raising security profile
- Buyer's Guide: Vulnerability-assessment tools
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- All the week's news, features and reviews
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Management Strategies

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Outsource or not?

Find out which technologies network executives are happy to outsource and which parts of their network they don't want anyone else to touch.

■ BY SUZANNE GASPAR

The decision to outsource some or all of IT requires a close look at the skills needed for performing hardware maintenance, software upgrades and configuration management. While some companies prefer to control everything in-house, trends show that companies are increasingly outsourcing tasks such as Web hosting, application maintenance and infrastructure management. However, trust is an issue with outsourcing, particularly for technologies that directly touch users, such as access management, help desk and customer relations. Network executives explain when to outsource IT functions and why.

Outsource

Cede control over content delivery.

Outsourcing content delivery to Speedera Networks' global distribution network is cost-effective for streaming video provider IFILM. "We're not in the business of building a video distribution network," says Blair Harrison, CTO for the company. The portal's staff produces content, offering Web viewers more than 80,000 movie listings and 15,000 short films, along with news, reviews and movie clips.

Based in Hollywood, Calif., IFILM serves 6 million visitors per month. Outsourcing obviates the need to buy the switches, routers and OC-3 bandwidth required to push hundreds of megabits per second when traffic peaks at 3 million views in six hours, Harrison says. Instead, IFILM routes viewers' requests to Speedera's network of caching servers, which deliver the video streams from points of presence on more than 1,000 backbone networks worldwide.

IFILM also avoids hiring four network engineers to manage streaming software loaded on multiple platforms, including QuickTime Streaming Server for Linux, RealNetworks, RealSystem IQ server for Linux, and Windows Media Server for Windows 2000.

Outsource VPN services.

Aventail's VPN services have a good prognosis at Oakwood Health Care of Dearborn, Mich. The VPN services cost considerably less than the $200,000 annual call charges incurred by users, especially when factoring in the staff required to support the previous home-grown remote-access service (RAS), says Dan Paton, IT adviser for the hospital system.

The VPN service relieves IT of fielding complaints from users spread across four acute facilities and 35 ambulatory sites, who suffered with the old RAS system's low modem speeds and shabby carrier lines.

Paton says outsourcing offers an advantage over building the VPN infrastructure in-house: "Not having to do upgrades twice a year or keep current with technology changes is an added benefit."

Hand off management duties.

When Cendian launched in late 2000, the chemical shipping company outsourced the monitoring of its hardware, applications and data center systems to SevenSpace/Nuclio.

Cendian leases four Unix servers from SevenSpace/Nuclio, and relies on the managed service provider to monitor its Sun servers running Solaris, Compaq servers running Windows 2000, various Cisco switches, firewalls, and Oracle and WebMethods applications. In-house implementation would require eight administrative staffers, plus a slew of management tools, says Jeff Seargeant, technical systems manager for Cendian in Atlanta.

"We'd have to build our own data center and invest in generators, uninterruptible power supply devices, air conditioners and huge Internet connections," he says.

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Keep control of critical functions.

Investment banking firm Putnam Lovell Securities outsources some portions of its network, but considers some applications, e-mail, security, network management and desktop support too critical for adopting an outsourcing model, says CTO Rodric O'Connor in San Francisco.

His IT department has the skills to perform hardware maintenance, software upgrades and configuration management on its WAN with aggregated data, voice and videoconferencing traffic. O'Connor says e-mail is critical for investment banking because of large volumes and attachments.

Concentrate on your core competencies.

IFILM is hanging on to the development of its application, encoded and editorialized video previews, clips and trailers, and exclusive independent films. The company's developers write the code for the applications to run on various browsers and servers. "It's the intellectual and creative substance of IFILM, just like Microsoft wouldn't outsource the development of its Windows application," Harrison says.

Tax Technologies, a financial and tax reporting software vendor, keeps development, security and customer service in-house "Our core competency is to understand our client's issues," says Jeff Wenger, CTO for the company in Bradenton, Fla.

IT updates servers with application revisions, and keeps its staging servers in-house to manage performance tuning.

Stand guard over security.

For Mt. Sinai NYU Health, keeping things in-house is done more because of security concerns. For the New York hospital, security is a top focus because of the confidential nature regarding patient data. mandating management of the back-end infrastructure, including the mainframe, portal and Citrix desktops, says Fred Eisenberg, senior director of IT and information security. The network of five hospitals manages access to patient data in compliance with Health Insurance Portability and Accountability Act of 1996, and other medical standards.

Outsourcing is risky when it comes to managing the hospital's data security requirements, Eisenberg says. "You open the door to a third-party and are one of many clients, meshed with everyone else on one system in a shared firewall environment. There's opportunity for mistakes that open up your environment to others and for information to be passed in the clear," he says. ■

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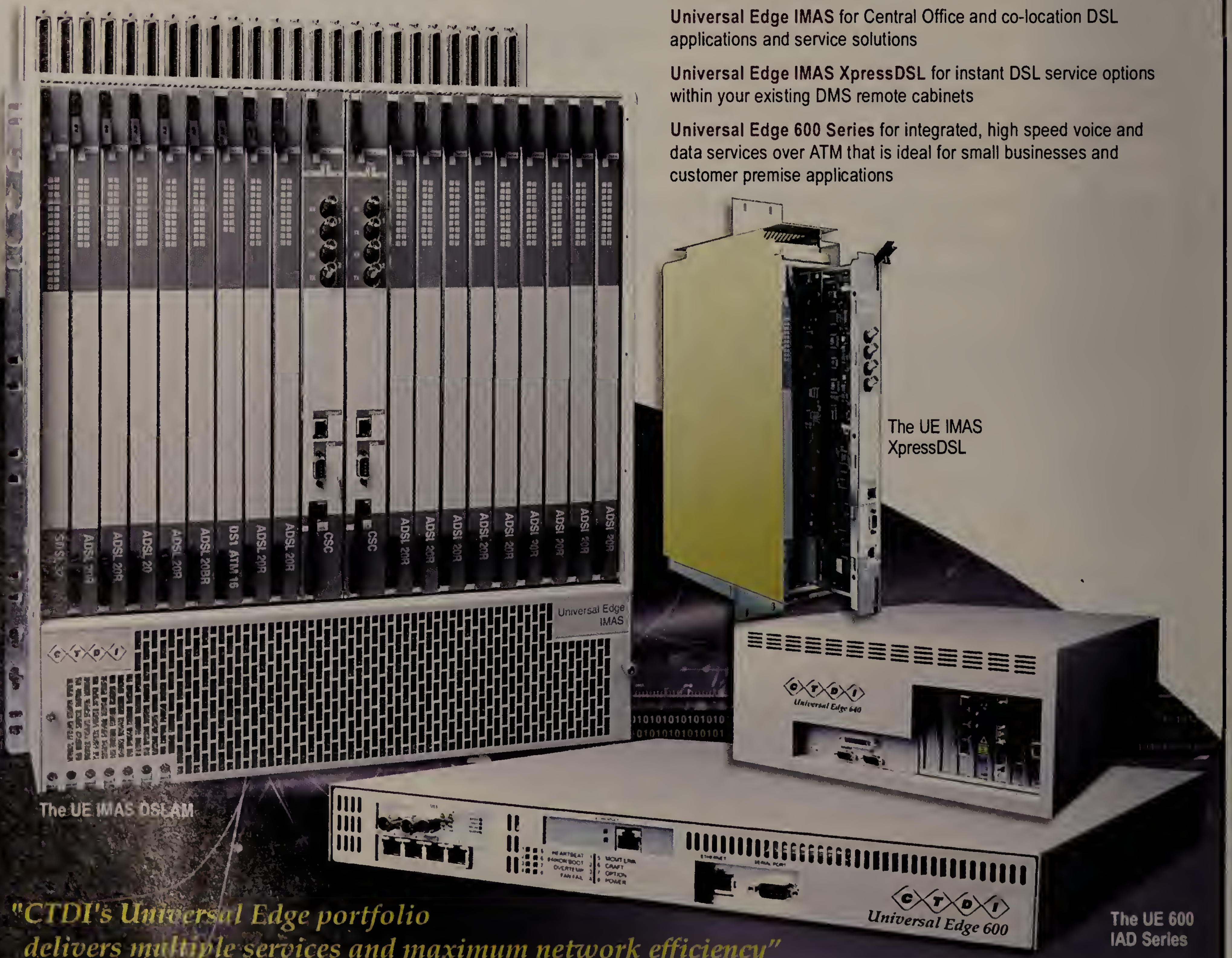

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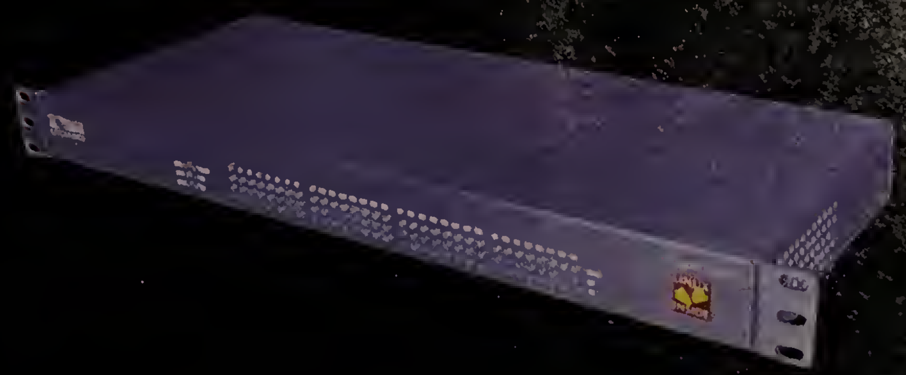

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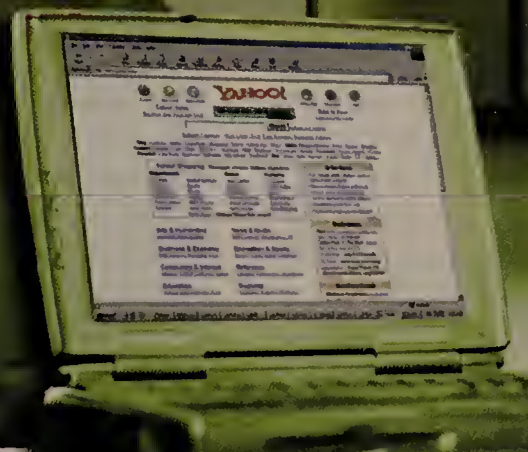

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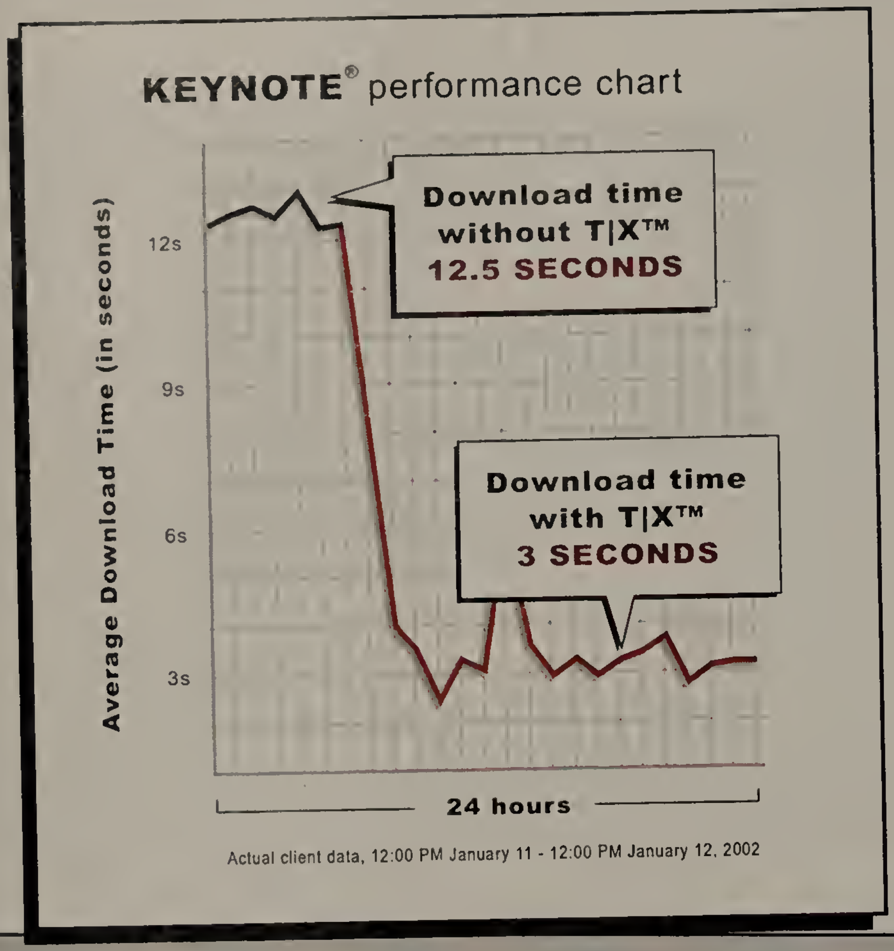

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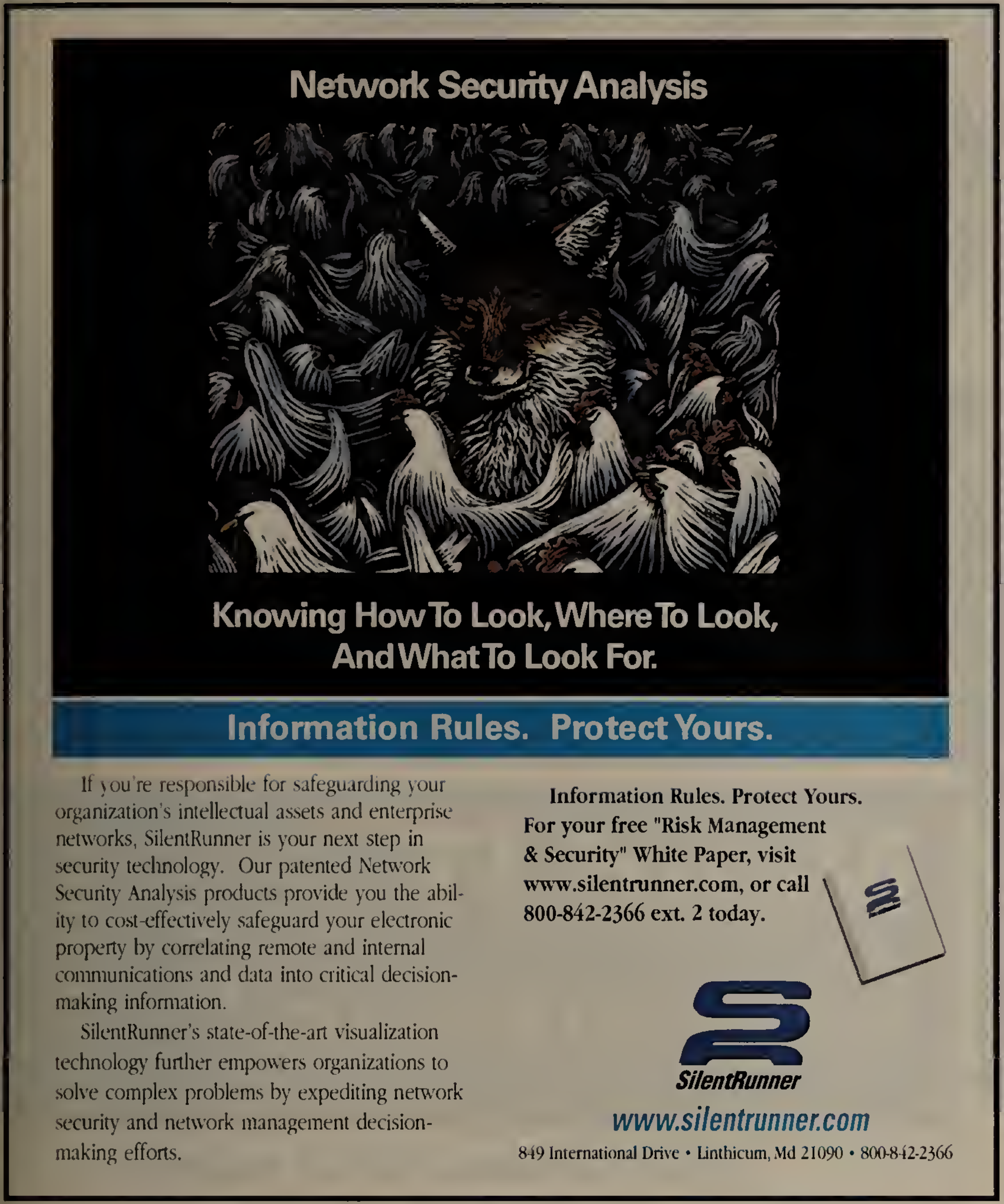

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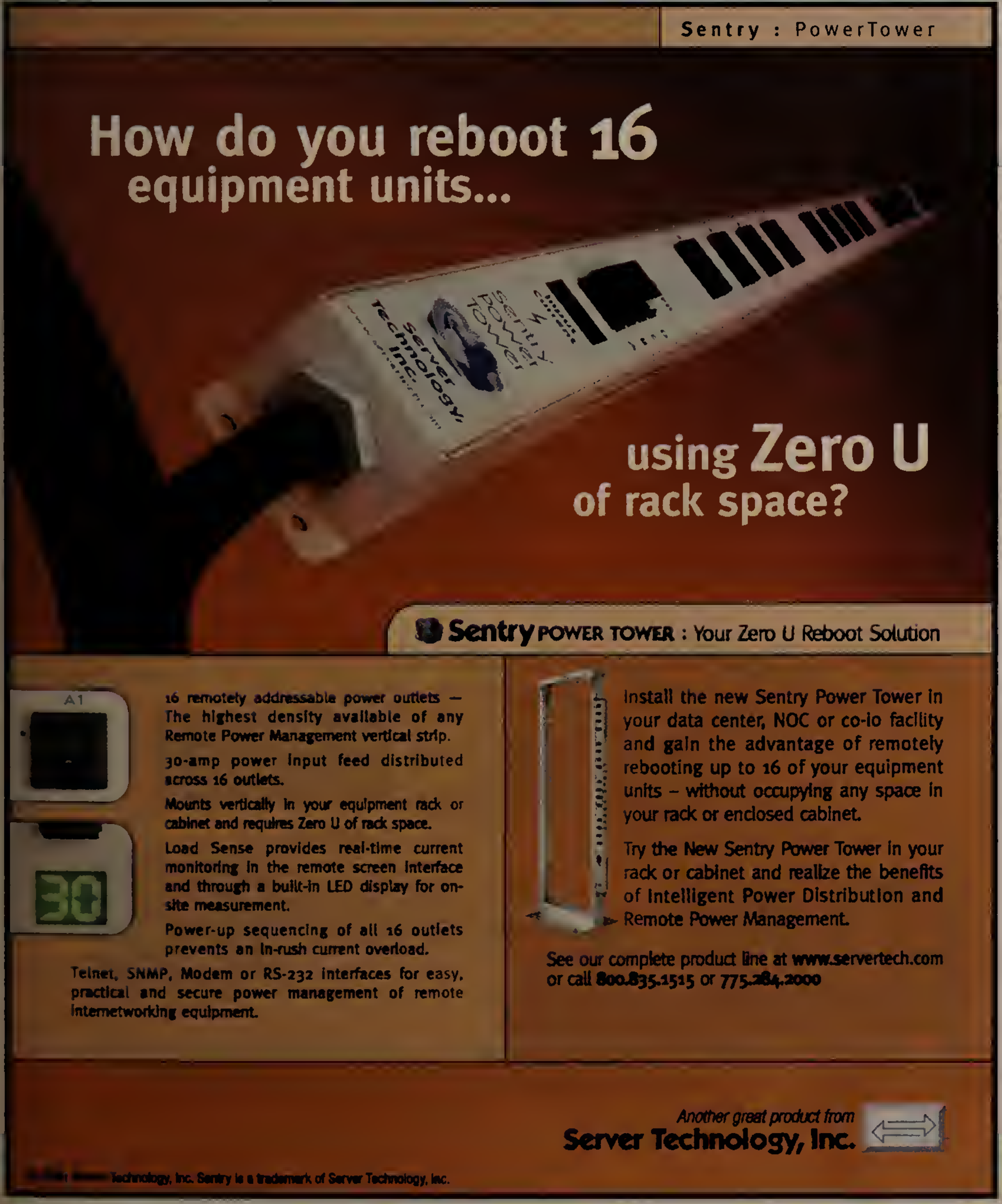

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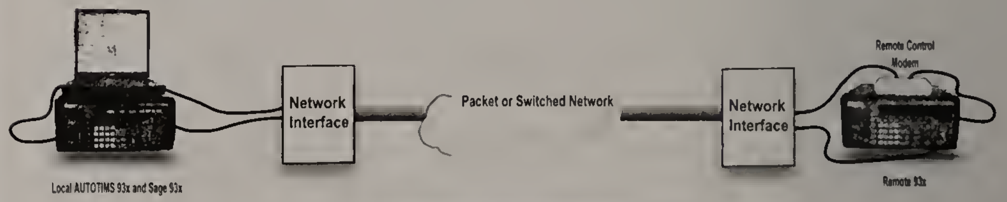

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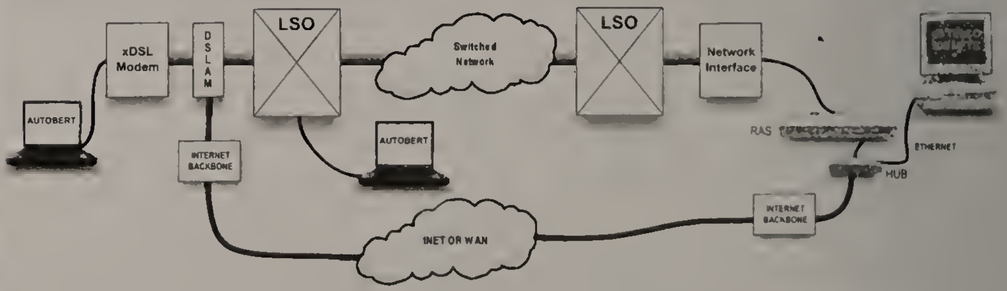

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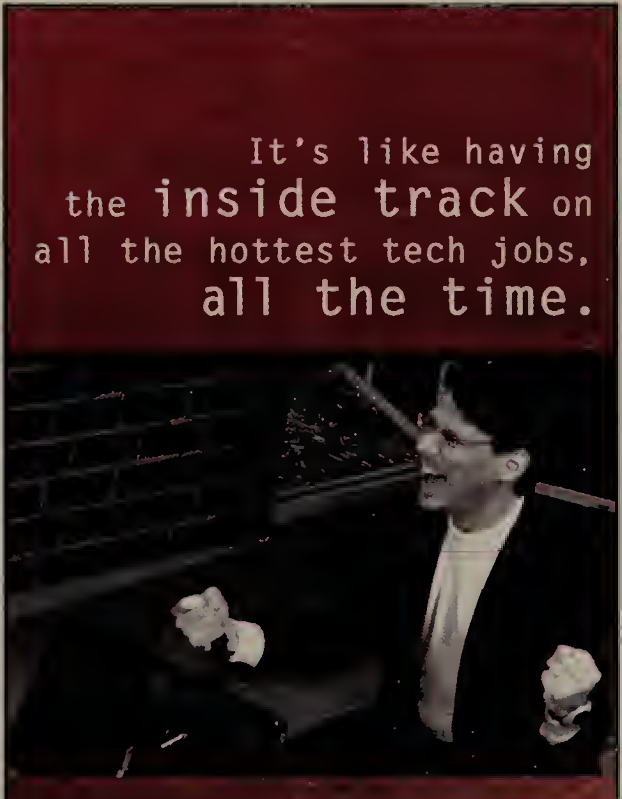
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Database Administrator (Pharma/Finance) wanted by New Jersey based Co involved in Ouantitative Marketing Analysis for Pharmaceutical Industry. Must have Masters in Comp. Sc., MBA (MIS/Finance) or equivalent, and 2 years of experience in computer software developing and/or consulting. Must also be proficient in Oracle, RDBMS managing tuning data and understanding financial concepts. Must also have Oracle certification. Respond to: HR Dept., Health Products Research, Inc., 3498 Route 22 West, P. O. Box 500, Whitehouse, NJ 08888-0500. Fax: (908) 534-9472, e-mail: careers@HPRmail.com. (Ref: GG8206IM).

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SuperComm

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Start-up SnowShore Networks, which makes media servers that process service applications in phone networks, will announce that it has signed up competitive local exchange carrier Z-Tel as a customer. In this case Z-Tel, a $276 million provider in south Florida, is doing more than just offering traditional services using less-expensive infrastructure. It is embracing SnowShore's gear and IP voice technology to offer services such as Web-enabled voice conferencing and voice portals that allow access to e-mail.

SUPERCOMM

That is a key announcement for SnowShore, says Christin Flynn, an analyst with The Yankee Group, because it demonstrates a service provider's belief in new technologies and new services. "A lot of service providers are focused on improving their operational efficiency, cost cutting and workforce reduction, but the bottom line is their customers haven't gone away. These providers are struggling to see how to make money off new services," Flynn says.

David Penny, vice president of marketing and business development at SnowShore, says that for a start-up like his, announcing a customer can be as important as announcing a new product. "It's critical proof that people need what you are building," he says.

And that is the kind of news that investors hope to hear at SuperComm. "The main buzz is on getting those early customers," says Mike Feinstein, a venture capitalist with Atlas Ventures. Even during these tough times, venture firms have kept the faith by ponying up billions of dollars for start-ups that make service provider gear. During the first quarter of 2002, the top 10 venture networking investments went to carrier equipment start-ups — a total of $649 million, according to a quarterly survey by PricewaterhouseCoopers and Venture One.

Change is necessary

Outside the show, there are other signs that changes necessary for a financial turnaround are starting to happen. For instance, Juniper Networks last week bought Unisphere Networks, an indication that consolidation is taking place in the carrier edge router arena (see related story, page 71).

That segment of the market is so bleak that one analyst regards it as a good sign that carrier edge router sales dipped only 8% between the fourth quarter of last year and the first quarter of this year. "Edge aggregation is pretty hot in a pretty cold area," says Kevin Mitchell, an analyst with Infonetics Research. Core router sales dropped 24% for that same time period, he says.

There are other signs that telecom vendors are scrambling. For example, spending this year among the top seven U.S. carriers is projected to be $43.9 billion, which is about 17% of their projected revenue, slightly higher than their historical annual spending range of 10% to 15% of revenue, says financial firm C.E. Unterberg, Towbin. But that is still "well below the 30% peak frenzy in 1999/2000," for the four regional Bell operating companies plus AT&T, Sprint and WorldCom, says an Unterberg report. This number includes recent cuts that reduced spending projections by 25%, Unterberg says.

Genuity this year will spend half of what it did last year on network equipment, said Steve Blumenthal, the company's CTO, who spoke at a telecom conference in Boston last week. Genuity's buying will focus on equipment that can support better service features such as service-level agreements, usage reports and faster provisioning.

The downturn in the economy seems to have slowed the development of advanced services such as metro Ethernet that business users need, and that is a concern to Richard Nelson, director of computing for the Information Sciences Institute (ISI) at the University of Southern California. ISI searched for metro Ethernet services but could find none, so is forced to lease fiber to create its own MAN.

Nelson says service providers can't delay embracing new technologies and services. "The carriers need to understand that the industry is changing, and it's getting more competitive," he says. "They're just going to be sidelined . . . unless they realize that."

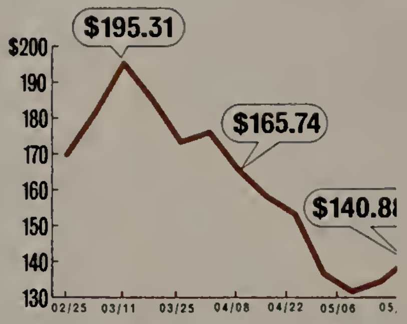
Smaller turnout expected

All the cutbacks in the real world are reflected in SuperComm by the number of exhibitors and the amount of space organizers have rented. Until last year, the number of exhibitors at the show had been growing at 20% per year for the three previous years. But the 2001 show was just 2% larger than 2000's, and this year's is anticipated to be actually smaller than last year's. In 2001, the show featured 853 exhibitors spread over 537,000 square feet in the World Congress Center as well as the neighboring Georgia Dome football stadium. This year 800 vendors will exhibit in 500,000 square feet without tapping space in the dome.

"A lot of these companies don't exist anymore," Flynn says, explaining why some exhibitors have melted away. More than a dozen service providers, including Global Crossing, McLeodUSA, PSINet and Yipes Communications, filed for bankruptcy protection since the last SuperComm.

The struggle

As this chart shows, telecom vendors continue to struggle.



The Nasdaq Telecomm Stock Index includes 3 securities and all types of telecom companies including service providers and equipment manufacturers.

SOURCE: NASDAQ.COM

Many companies that survived but can't afford a booth at SuperComm will be lurking in nearby hotels and luring potential customers away from the show for private meetings and demonstrations, Flynn predicts.

SuperComm will feature a long list of educational sessions that will include a debate about the best use of various broadband access technologies to network small offices and home offices into corporate networks. *Network World's* Broadband Showdown will pit representatives of cable modem, DSL, fixed wireless and satellite services against each other to demonstrate the merits of each. Ultimately, end users are less concerned with the underlying technology than with price and what other services can be added on top of the broadband link, says Amy Harris, an analyst with IDC who will help moderate the showdown.

New products will abound

Still, the show will yield a raft of new products and upgrades with a bent toward the practical:

- All Optical Networks is demonstrating its Metro Scout optical multiplexer that shifts the wavelengths of standard 1310-nm optical channels so as many as four of them can be carried on one fiber. The purpose of the box is to give enterprise customers a way to quadruple the capacity of their existing campus or metropolitan-network fiber using optical interfaces on their gear. "The idea is it works with legacy gear. You can add it to existing networks with minimal changes," says All Optical's CEO Ralph Bennett.
- Marconi is introducing the ASX 4000M, a smaller version of its ASX 4000 40G bit/sec ATM switch that has the same switching capacity. The company has added new cards for channelized DS-3 frame relay and DS-3 ATM circuit emulation, as well as an adapter card so it can handle cards built for Marconi's TNX and ASX models.
- Catena, Nokia, One Access, U.S. Robotics and Xyzel all are introducing DSL gear ranging from customer site integrated access devices to service provider aggregation multiplexers. This equipment can be used to deliver broadband DSL services to users more efficiently.
- 3Com will announce an alliance with Atrica to provide customer site Ethernet switches to go along with Atrica gear as a way to let carriers provision Ethernet metropolitan-area network services.
- VocalTec is introducing new features for its Series 3000 softswitch, including call routing based on time of day or week, better interoperability with Cisco VoIP gear, and reduced delay between the time a caller punches the last digit and the time the phone rings on the other end. These capabilities can translate into services that let businesses integrate their corporate IP phones with public networks and get services with quality as good as traditional circuit-switched voice.
- Also in the area of packet voice gear, MetaSwitch will roll out VP3500, a new voice switch with local calling features. It will support traditional voice calls, voice over ATM and VoIP, letting businesses converge their voice and data services on carrier packet networks.
- Similarly, Santera will debut a packet-based voice/data switch with local switching and backbone trunking capabilities. The new gear will support up to 200,000 voice calls, the company says.
- Aplion is wheeling out a new version of its customer premises and carrier point of presence gear called Virtuoso 3.0 that supports quality of service on an application level and streamlining service provisioning via a point-and-click management software interface.

Senior Writers Phil Hochmuth and Michael Martin and News Editor Bob Brown contributed to this story.

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Juniper/Unisphere challenge Cisco

Observers wonder whether deal signals renewed industry shakeout.

■ **BY JIM DUFFY**

“It's time to lead, it's time to put together this comprehensive set of products. It's time to stop waiting for this market to recover and time to make it happen.”

Scott Kriens
CEO, Juniper Networks

SUNNYVALE, CALIF. — Will Juniper Networks' $740 million buyout last week of edge router rival Unisphere Networks give the downtrodden telecom industry the push it needs to get on the road to recovery? Juniper CEO Scott Kriens thinks so.

“If you wait for the recovery, it's been led by someone else,” says Kriens, whose company is Cisco's biggest rival in the router market. “It's time to lead, it's time to put together this comprehensive set of products. It's time to stop waiting for this market to recover and time to make it happen.”

Industry watchers give the Juniper/Unisphere combination a thumbs up and say the deal — along with two recent, smaller Cisco acquisitions — may signal that at least the equipment side of the telecom industry is headed toward a badly needed shakeout. The industry's more-established players have now had a chance to digest many of their acquisitions from the feeding frenzy of a few years back.

“Once the large players get a little more visibility into what they actually need, we're going to be seeing more of them going back to buying companies and technologies because the prices are still relatively attractive,” says Erel Margalit, managing partner at Jerusalem Venture Partners.

As for Juniper, buying Unisphere would let it regain the No. 2 spot in carrier edge routers, behind Cisco, which Infonetics Research says owned 59% of the market in the first quarter vs. 18% for Unisphere and Juniper combined (Unisphere leap-frogged Juniper into the No. 2 spot last year). The deal also would let Juniper tap the global distribution network and customer base of Unisphere parent Siemens Systems. Siemens formed Unisphere in late 1999, citing at the time its plans to devote an initial $1 billion toward the data/IP network market.

“This was a smart move on Juniper's part,” says Christopher Nicoll, vice president of Current Analysis.

In addition to instantly gaining more market share, Juniper obtains its third giant distributor with access to carriers around the world. Juniper already has distribution agreements with Ericsson and Nortel, and through this acquisition inherits a relationship between Unisphere and Siemens. While overseas carriers aren't without their struggles, observers say having a broad international presence is key for equipment makers while so many U.S. carriers are hurting.

The deal also effectively marks Juniper's entry into the DSL market and gives the company DSL aggregation and subscriber management capabilities that, for the time being, will augment its edge portfolio of T-1/T-3 dedicated-access platforms. Unisphere's routers also might give Juniper a more appealing lineup of products with which to court the coveted business of incumbent local exchange carriers, which are building out DSL as a broadband access alternative to cable. Juniper entered the cable modem termination system market with last year's acquisition of Pacific Broadband.

“As a ‘single-purpose’ product company, Juniper has been hurt by its lack of revenue diversity in other market segments,” says Bill Lesieur, director of Technology Business Research. “Juniper recognizes it must broaden its solutions portfolio to further strengthen its status as a Tier 1 telecom equipment provider.”

But questions remain in terms of product overlap and how the operating systems of both companies' routers will be integrated, if ever. One of the attractions of Juniper is a single, common version of its JUNOS operating system running across its entire product line, from edge to core. This is in contrast to Cisco, which Juniper says has 16 different versions of IOS running on its Internet routers.

Senior Editor Tim Greene contributed to this story.

802.11a

continued from page 1

clearly several times faster [than our older, pre-802.11 wireless LAN].”

Mount Saint Mary will begin deploying this week a campuswide 802.11a wireless LAN that will use nearly 100 access points.

Moving pictures seem to be a real attention getter for early customers. “I saw the SMC Networks 802.11a product, and I realized it had all the available bandwidth we needed to do streaming video,” says Tim Meriwether, a volunteer engineer with KOCT, a community television broadcaster in Oceanside, Calif. “We have totally successfully demonstrated that this works. It's just amazing.”

So are the potential savings. Meriwether says that by using 802.11a products, the station will save most of the estimated $28,000 in high-end equipment that's usually needed to tie mobile television camera feeds into a video studio at the station.

A number of wireless LAN vendors now offer 802.11a access points and interface cards, most of them designed for laptop or desktop PCs, although some are available for handheld computers. The vendors aiming at the enterprise network market with available products include Intel, Proxim, SMC and Symbol Technologies. Others, notably Agere Systems, Cisco and Enterasys Networks, are expected to roll out 802.11a products for enterprise networks in the next few weeks.

Prices run from just less than $300 to just more than $500 per node for enterprise gear. Premium vendors, such as Cisco, likely will charge more, based on advanced systems management, security and other features.

Thinking about throughput

In wireless LANs, throughput is relative. Actual throughput hinges on many variables, such as distance, building materials, even the number of people walking through the area. But even under optimum conditions, 802.11a products typically offer much less than half of the theoretical radio speed. (For a comparison of four 802.11a products, reviewed by the Network World Test Alliance in January, see www.nwfusion.com, DocFinder: 9552.)

The performance range that Mount Saint Mary and KOCT found varied widely. College network administrator Arthur Emerson found that radio link speed (the speed with no data being pushed over the air) was subject to all kinds of variables. Putting one Proxim Harmony 802.11a access point in the center of one dormitory created a fairly robust 12M bit/sec to the furthest corners. But when he added a second and positioned the access points opposite each other on two sides of the building, throughput jumped to 35M bit/sec.

Although, Emerson confesses: “I'm not sure I believe some of this.”

Radio test tools for 802.11a are not as sophisticated as those for 802.11b, he adds.

Emerson expects actual throughput to be in the range of 8M to 12M bit/sec to distances of up to 30 feet from the access point. That will still be two to three times the throughput of the Proxim RangeLAN2 wireless network that's been a staple on the campus since 1995. The RangeLAN2 is a proprietary radio that has a bandwidth of 1.6M bit/sec in the 2.4-GHz band.

At KOCT, Meriwether says he's getting transport speeds of 36M bit/sec and sometimes higher. He says the result is “rock solid” video displays on a laptop screen, with full stereo sound, at distances of 50 to 75 feet.

Coverage and distance

The higher frequency of 802.11a means that the radio waves travel shorter distances, and have more trouble penetrating walls and other obstructions than the 2.4-GHz radio in 802.11b wireless LANs. In theory, this means that you'll need more 802.11a access points to cover the same area as with 802.11b.

Early experience at Mount Saint Mary indicates that in practice this is sometimes true, and sometimes not.

“We thought we'd need about two times the number of access points at first,” Bucek says. That remains true where buildings are made of lumber and Sheetrock. But for steel and concrete structures, Bucek now estimates they'll need about three times the number of 802.11b access points.

But some of the additional access points are because the college wants redundancy. “If one access point fails, there is at least one other close enough to give you your Internet access,” he says.

Fiddling around

Emerson says his IT staff will have to learn afresh the idiosyncrasies of 5.4-GHz radios. They've noticed that the Proxim access point is quite sensitive to how its two visible antennas are positioned. Moving one antenna from horizontal to vertical, for example, can affect signal strength and range. And that creates a new worry: The old RangeLAN2 access points were mounted out of sight. Some number of the Harmony access points will be in plain view.

“They're just out there for people to see … and to fiddle with,” Emerson says.

In many cases, installation appears to only involve replacing the old access point with a new one. At Mount Saint Mary, some Ethernet cable will be pulled to new locations, but it's part of a long-planned upgrade of the 10M bit/sec backbone to 100M bit/sec. ■

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BackSpin Mark Gibbs

No kidding, no security

"Hackers posing as employees of the Ford Motor Credit Company have in recent months harvested a trove of 13,000 credit reports — a virtual one-stop shop for fraud and identity theft — with data on consumers in affluent neighborhoods across the country. [Ford] said in a letter to the victims that computer intruders used an authorization code from Ford Credit to get the credit reports from Experian, one of three major reporting agencies."

— *The New York Times*, May 17, 2002

No! Surely not! A credit reporting agency screwed up? Never.... Yeah, I'm kidding. What a joke! We all know that the big credit reporting agencies (Equifax Credit Information Services, Trans Union and Experian Information Solutions) are to information security what a black felt marker is to Sony's Key2-Audio CD copy-protection technology.

<digression>In case you missed the news, Sony spent a bundle developing and deploying the Key2Audio anticopying mechanism that was cracked this week. Turns out the Key2Audio method consists of a corrupted data track written on the outermost region of a CD. When a data-aware CD player reads a Key2Audio disk, it gets confused because the track is malformed and is unable to read the audio tracks.

Turns out that all you need to do is cover up the data track — a $1 felt marker will do the job — and you can circumvent the copy protection. What was Sony thinking?</digression>

Anyway, as I understand it, Experian et al aren't exactly at the forefront of information technology, so this security breach is not exactly surprising. Indeed, it's surprising we haven't heard about this kind of screw-up before.

What am I saying? It isn't surprising at all that we haven't heard of these snafus! Why the hell would any of the credit reporting agencies fess up unless their cover was blown? Forget that the Federal Trade Commission has fined all three agencies several times, the fact is the Fair Credit Reporting Act (www.nwfusion.com, DocFinder: 9537) is unenforceable without the reporting agencies being subjected to a lot more oversight.

To effectively provide oversight would require that the feds actually examine what goes on inside the IT systems of the agencies. That would cost lots of money. And even though we know that all that is needed to gain access to their systems is a simple name and password, the political will is obviously weak when it comes to getting into the ring with such rich and powerful organizations.

And the worst thing is that the big three aren't the only financial village idiots out there. The chances are high that you will one day try to cash a check as I did on July 13, last year, only to have Telecheck International — a subsidiary of First Data Corp., — reject it (see "Quick fixes for checks and dogs," www.nwfusion.com, DocFinder: 9547).

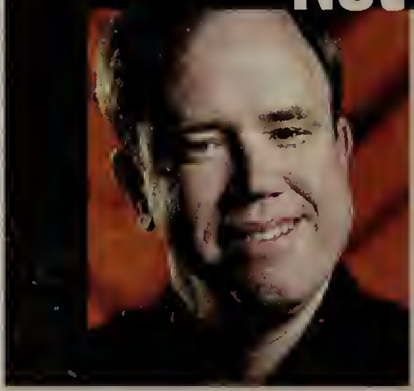
Despite faxing them my details so that they could correct what they admitted was a screw-up in their database, I have never gotten a reply of any kind. And as far as I understand, there is little to compel them to do so. I don't think expecting some kind of reply is unreasonable, and what I'd really like is for them to be heavily fined. Say, $1 million per mistake.

Anyway, this raises the "interesting" issue not of whether we should clamp down on these idiots but whether we can afford not to. Let's say that the FTC investigates Experian over this security fiasco and maybe fines them. What happens next time?

Next time, do we just fine them again? What if it is not 13,000 consumer records but 30,000 or 300,000?

We'd better hope that there are details about politicians in the stolen information because then there would finally be a decent chance that something would happen.

No kidding to backspin@gibbs.com. Well, maybe a little.



'NetBuzz News, insights, opinions and oddities

By Paul McNamara

What HP thinks of guys like us

Hate to break the news so bluntly, guys, but Hewlett-Packard thinks we're a bunch of idiots. And by guys I do mean guys . . . married guys to be precise.

How do I know HP holds us hubbies in such low regard?

I watched the company's new television commercial for its line of digital photography products. The ad aired several times during a basketball playoff game between the Boston Celtics and New Jersey Nets. For those who missed the spot, here is the gist (keeping in mind I was off-duty, not taking notes):

A fellow — who we soon learn is an idiot — walks the aisles of a grocery store staring intently at his shopping list, which he appears to be holding up to the items on the shelves.

Cut to a shot of the idiot's kitchen where his wife — who apparently did not put a premium on brains when shopping for a spouse — is seen taking pictures of items in the couple's cupboards.

Then we get our first close-up look at the idiot's shopping list: Oh my, it's not a list at all, but rather a series of photographs printed on a piece of paper. We now can figure out that opening scene: Our idiot was matching the pictures his wife took to the corresponding items on the store shelves.

"A shopping list that won't confuse your husband," HP tells the audience, which, given the nature of the programming, was undoubtedly weighted toward the male end of the spectrum.

And finally, just in case we somehow missed the subtlety of the message, the commercial concludes with a question about this use of HP's photo-printing technology: "Why not if it's this easy?"

You can tell Buzz wasn't amused, can't you.

Maybe it was because I had just unloaded about a thousand dollars worth of groceries that I shopped for and bought all by myself without the help of any pictures.

But more likely it's because this type of advertising — hubby is an idiot, Dad is a moron, men are cads — has become so commonplace on television as to turn me into a humorless crank.

Take the commercial from a local bank that wants our business and is touting its online services as a draw. The ad shows two women discussing one's upcoming birthday and the likelihood that her husband had bought her a nice gift. Thanks to that technological marvel we call the Internet, the women are able to tap into the bank's network and get an up-to-the-minute accounting of what hubby has charged to his debit card.

Sure enough, there is a fresh $250 entry.

For fishing tackle. . . . The cad.

My own HMO, Tufts Health Plan, has a commercial in which a single dad — obviously harried, obviously a moron — sticks the wrong end of the thermometer into the mouth of the younger of his two tykes. The older child is left to spot and correct the blunder.

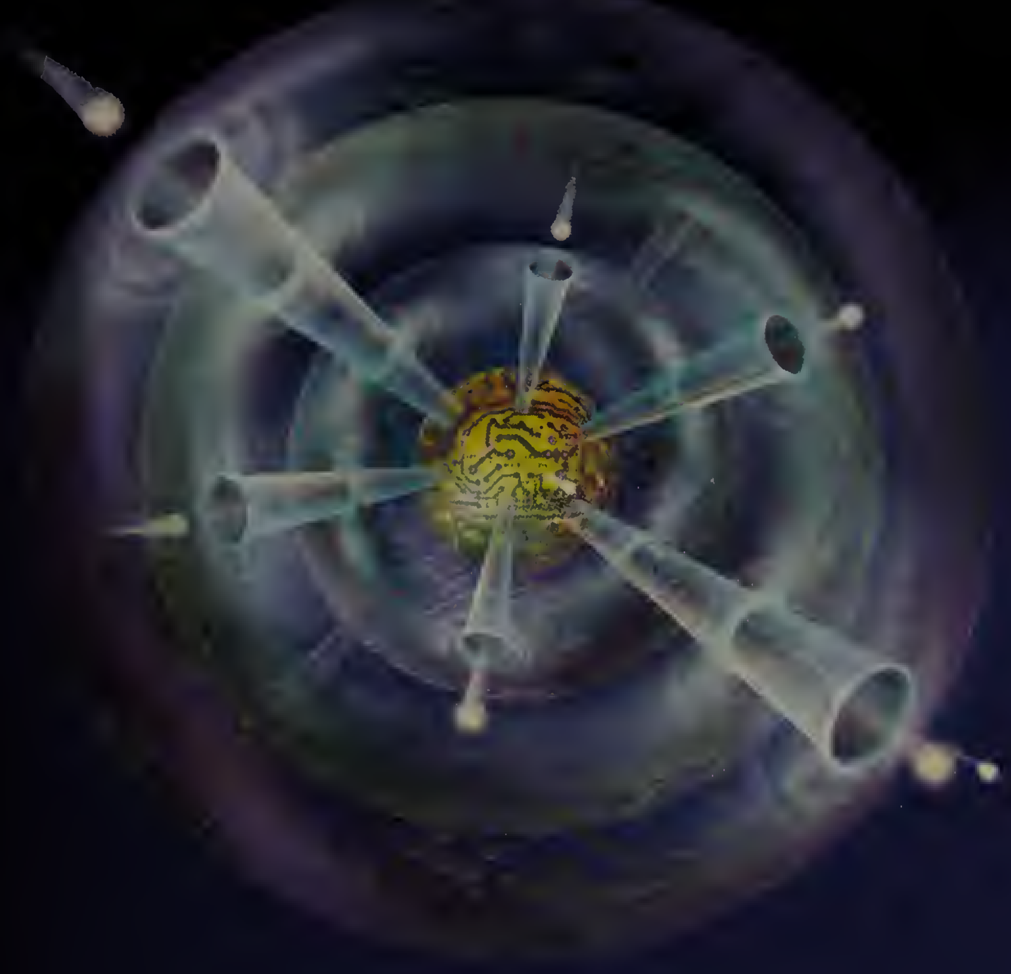
Don't misunderstand the point here. None of this rises to the level of serious discrimination; we aren't talking about police stopping minorities for being minorities, or women making 70 cents to a man's dollar for equal work.

But here's the question for HP CEO Carly Fiorina: Would you air a TV commercial bragging that your technology is so simple even a woman can use it?

Of course you wouldn't. And not just because such an ad would anger the women you want to buy your products.

You wouldn't do it because this is the year 2002 and we're supposed to be beyond that sort of thing.

Use pictures if you must, but send all comments to buzz@nww.com.



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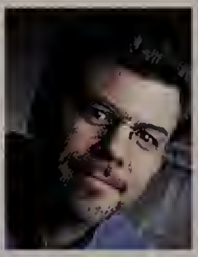

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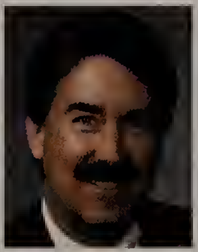
Jamie Lewis, Burton CEO and Research Chair Industry columnist, directory pioneer and renowned expert on directories, security, messaging, and identity and access management.



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"There is no reason for any individual to have a computer in their home."

1977

"Portal, schmortal."

2002

(Pooh-pooh it now, while you still can.)

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